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## LAYING CONCRETE IN POLAR WEATHER

Concrete Sewer Built in Cold Canadian Winter Weather by Municipal Forces—Thawing and Heating the Aggregate—Keeping New Sewer Warm—Precautions Taken in Trenching and Backfilling

By W. E. HARDENBURG.

Some very interesting concrete work has recently been completed in Calgary, Alberta, Canada, which, considering the severity of the cold, seems to indicate that this work, when proper precautions are observed, may be done as well in ordinary winter weather as in summer.

The work in question was the construction of a concrete sewer, designed to drain several outlying subdivisions lying north of the city proper and across the Bow river, and at the same time to provide relief work for a number of temporarily unemployed men.

The sewer, of oval cross section, 4 ft. by 2 ft 8 in., was 1.47 miles in length. All of it was open cut, although there was about half a mile of additional tunnel work constructed of brick. The oval ring of concrete was eight inches thick, and, but for the weather condition that prevailed, there were no very unusual features in connection with the work, unless perhaps the connection of the sewer with the main trunk system, south of the Bow, might be so called.

During its course north of the city proper, the sewer crossed a creek at two points. In both cases an inverted syphon was employed containing 12-inch and 16-inch pipes, so arranged that it will be possible later, when the need arises, to add to them others of larger size. In connection with the junction with the main trunk sewer, south of the river, however, it was found necessary to construct an inverted syphon 957 ft. 8 in. long, under the bed of the river. For constructing this, two shafts were sunk, the north shaft was 12 ft. 4 in. by 9 ft. and 53 ft. deep; the south shaft was 9 ft. 2½ in. by 6 ft 6 in. and 66 ft. deep. This syphon contains a 33-inch, a 24-inch and a 20-inch pipe. From the southern shaft the sewer whose construction is described in this article was easily connected with the main six-foot trunk sewer.

In the case of these inverted syphons, as with all others in use in the city, the question of satisfactory velocity was carefully considered. The sewers on either side of the syphons described were of course designed with reference to the needs of future years, much in excess of present requirements. The syphons were planned to meet, first, present needs; second, excesses due to heavy rains, etc., and third all requirements in after years. In all cases, arrangements were made to satisfy these conditions and at the same time to secure proper scouring velocity.

By the use of weir chambers, the flows under these three conditions became concentrated in pipes of differing diameters, so that each contingency is satisfactorily provided for: one pipe for the normal present flow, a second for flood conditions and a third for use in the

future, each operating automatically and each independent of the other.

The whole work was carried on directly by the city, no contractors being employed. The whole of the sewer work and the completion of the large syphon was done under the supervision and management of A. S. Chapman, sewerage engineer and superintendent of sewers, assistant to George W. Craig, M. Am. Soc. C. E., city engineer, to whom the writer is indebted for the information upon which this article is based.

As the work was undertaken largely to provide an opportunity of earning a livelihood for the unemployed, most of whom were absolutely unaccustomed to this class of labor, more than ordinary supervision and care was required on the part of the foremen and the sewerage engineer. The character of the ground, a light loam, perhaps compensated in part for this, being well suited to winter work.

It was anticipated that the top three feet would be frozen solid and that the effect of frost would be felt for three feet more, but a heavy snowfall just before the work started kept the ground warmer than was expected, so that, below three feet, little frost was met with. The average depth of the excavation was 14 feet.

Although the winter was rather milder than the average, temperatures varied greatly, ranging from 40 degrees above to 20 degrees below zero. Perhaps it would be fair to say that, for the whole period, the average temperature was something over 20 degrees above zero. Preparations were made, however, to combat a prolonged spell of Arctic weather, and city officials are convinced that the work could have been successfully carried out in the face of much colder weather than that experienced.

From the first, care was taken to open up no more of the trench at one time than was necessary, since the greater the distance left open, the greater would be the effect of the frost and the greater the expense would be, it being obviously inadvisable to place concrete in a frozen trench.

Some saving, however, was effected because of the frost, the ground being so firm that a minimum of timbering was necessary. It was only in a few cases that the lower six feet of the excavation was timbered at all. When the trench had to be left over night before the forms were set and the concrete placed, about three inches of ground was left unexcavated on the bottom and the lower six feet of the sides, so that in the morning, when these surfaces were trimmed, all was ready for the placing of the concrete. When

the trench had to be left at full depth, it was partly filled with dry hay manure, which kept out the frost, even in the lowest temperature. In the few cases where shale was encountered, similar methods were adopted.

For the making of the concrete, clean pit-run gravel was used, which was taken from banks near the river. It was so clean and so well mixed that, without adding sand, an excellent aggregate was secured which formed a surprisingly dense mass. This gravel reached the work in frozen masses and was placed in piles of from 16 to 20 cubic yards each, into which were plunged five or six wrought-iron pipes, five feet long and two inches in diameter, connected by flexible hoses with a portable boiler, which supplied steam. The pipes were plugged at the lower end and perforated with many small holes, through which the steam escaped. The pipes were moved from point to point constantly, day and night, until the whole pile became hand-warm. Tarpaulins protected the surfaces of the piles. The cement was kept under tarpaulins close to the boiler or else in a heated shack nearby. Water was kept at 75 degrees and the materials were mixed close to the trench so that they were sufficiently heated to withstand the cold for the short time they were exposed to it. Whenever the wind arose, screens were placed around the concrete stages and thence to the sewer. In all cases, it was found that the wet concrete was very little warmer than that used in summer, and not by any means warm enough to have any injurious effects.

For ease in handling the forms and to ensure good packing of the concrete, the invert was laid first. Then the sides were brought up to the springing and quickly covered with boards, upon which about a foot of dry hay manure was immediately placed. The whole was then covered with tarpaulins. Within a day and a half, the concrete was hardened sufficiently to admit of the arch being put on, when the same protective process was repeated. All forms were carefully coated with black oil every time they were set.

In order to counteract icy draughts and to facilitate

the setting of the concrete, lighted lamps, about 30 feet apart, were kept burning for over a day in the newly completed sewer. Forms were not generally drawn for two days, and it was invariably found that the concrete had set up well. After three days more, the covering of boards and manure was removed and backfilling began. The trench was filled for the first three feet with dry material, all lumps being broken up; after that, ordinary filling was used without any particular care and left to settle.

Throughout the work, an average of about 480 lineal feet of finished sewer was constructed each week, including backfilling. The number of men employed was between 300 and 400, all of whom were supplied by the civic labor bureau in accordance with the rotation in which their applications were received. During the week of exceptionally cold weather, the average weekly run was slightly exceeded. In one section, where the ground was swampy, the concrete was reinforced, and this entailed some little delay.

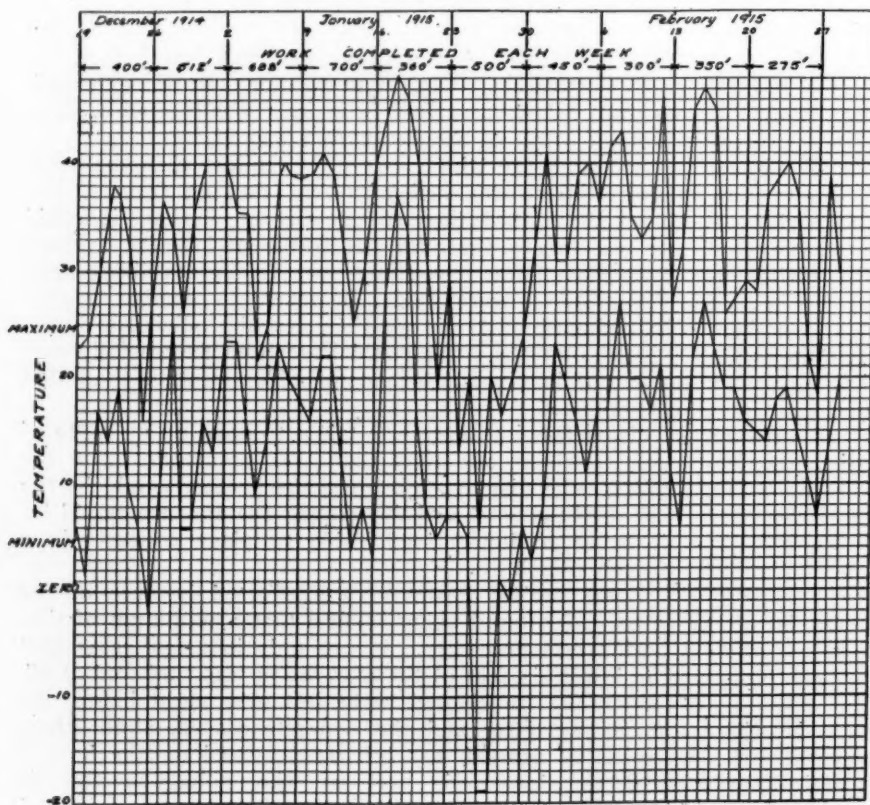
On inspection later, it was found that the concrete had set very satisfactorily, although, as had been expected, the filling in the trench had subsided considerably in places. This, of course, was easily remedied.

With the completion of the work already described, the last great link in the sewerage system of the city of Calgary was forged, all outlying portions of the system now being connected up with the main body of it. The whole system is now complete and all the outfalls lead to the site of a proposed \$300,000 sewage disposal plant. The site of the proposed plant is on the bank of the Bow river at Bannybrook.

The type of plant has not yet been fully decided upon. While it is understood that the activated sludge method is regarded somewhat favorably, it is probable that the results of further experiments with this system in the United States and elsewhere will be awaited before a decision is reached in the matter.

Including the sewer described above, the city of Calgary has now laid 194.03 miles of house sewers, exclusive

of the Bow river syphon previously mentioned, and 6.22 miles of storm sewers. About 30 miles of the whole consists of trunk sewers. There are 8,880 connections, 1,974 manholes and 1,186 catch basins. Of the house sewers, 182.6 miles are vitrified pipe 8 to 30 inches in diameter; 9.3 miles are concrete, 36 to 72 inches diameter; 0.4 mile is concrete invert with brick arch; 0.5 mile is brick, and 0.9 mile is vitrified sectional tile. Fourteen hundred feet is in syphons, all steel pipe except 140 feet of concrete. This does not include the tunnel for syphons under the Bow river, which is 558 feet long. Of the storm sewers, 4.3 miles are vitrified pipe 12 to 30 inches diameter, one mile is 30-inch vitrified sectional tile and 0.9 mile is 18 and 24-inch concrete pipe.



TEMPERATURES DURING CONSTRUCTION OF SEWER.

The upper curve shows the maximum temperature each day during the work, and the lower curve the minimum temperature. At the top of the diagram is given the number of lineal feet of sewer completed each week. These amounts apparently were not controlled in any way by the temperature.

## FIRE PREVENTION IN PORTLAND

### Number of Fires Reduced Fifty Per Cent by Fire Bureau—Inspection, Education and Arson Detection—Fire Drills in Schools.

By HALDANE WHITE.

A fifty per cent reduction in the number of fire alarms, a corresponding reduction in the city's total fire loss, the reduction of fire hazards to a minimum and the elimination almost entirely of false alarms are the net tangible results of eleven months of a fire prevention campaign conducted by the Fire Bureau of the city of Portland, Ore. The whole work has been done without additional expense.

A study of the accompanying table of fire alarms by months and totals since 1912 shows clearly the remarkable results in the way of reduced fire alarms. The campaign was started soon after January 1, 1915. The figures show that during January, before the work got well organized, the number of alarms was on the increase. They had been increasing steadily and rapidly for ten years, as had also the city's fire loss.

Then in February, which generally in years past had been a bigger month for fires than January, there is shown a material reduction not only over January but over the February of the year before. And so the table runs, showing clearly the efficacy of the campaign. There is not a month since the campaign got well started that there has not been a big decrease in the number of fires over the corresponding month of other years. Taking totals for the eleven months of each year from 1912 until the present, it is shown that 1915 will be far under any of the other years. In 1912 there were 1,157 during the eleven months; in 1913, 1,209; in 1914, 1,714, and during 1915 only 927.

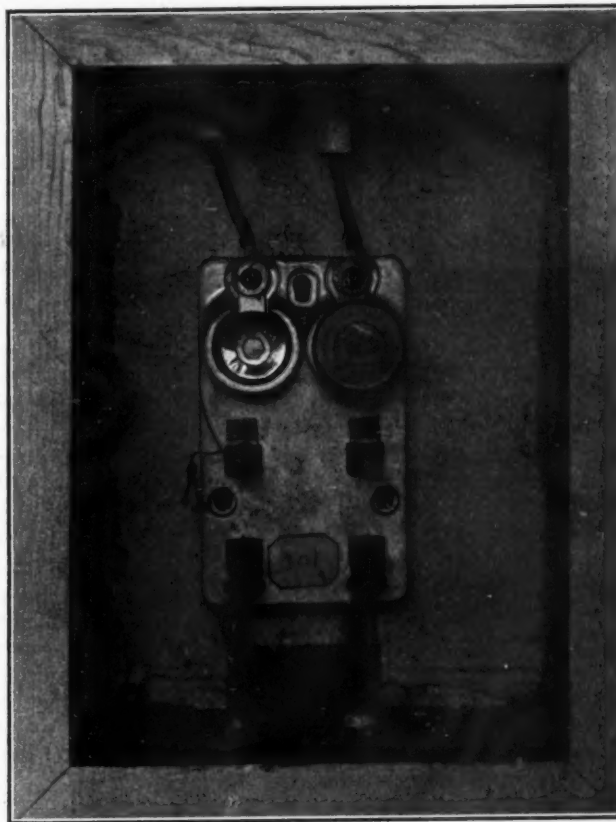
Comparative Table of Fire Alarms, 1912 to 1915.

Showing decreases in 1915 due to fire mars hal's campaign.

	1912	1913	1914	1915
January .....	106	119	120	145
February .....	101	143	145	96
March .....	132	133	173	116
April .....	99	93	128	98
May .....	112	90	134	71
June .....	122	77	138	62
July .....	98	116	233	52
August .....	92	122	277	88
September .....	102	126	124	73
October .....	95	117	94	61
November .....	98	109	148	65
Totals .....	1,157	1,209	1,714	927

Inspection is the basic secret of the results obtained. There has been organized to conduct the campaign an extensive fire marshal organization made up of Battalion Chief Jay Stevens, who serves as fire marshal, and a captain, lieutenant and fireman from each engine and truck company, 105 in all, who serve as deputy fire marshals without extra pay. Each has certain fire inspection work to do within the district covered by his station. Then there is an arson squad made up of three firemen who investigate all fires where there is suspicion of arson or where the cause of the fire is not easily found. All the deputy marshals and the arson squad members and the fire marshal himself attend to their regular fire duties and do the inspecting as a side issue. They are subject to call at all times with their regular companies. The system involves no more expense than is necessary for the purchase of record books, stationery and a few odds and ends of office supplies.

The work of the deputies in the various stations as definitely laid out for them consists of inspecting each



"JUMPING" AN ELECTRIC FUSE BLOCK. A COMMON AND DANGEROUS PRACTICE.

dwelling in their district at least once each six months, each business house at least once every three months, each school house at least once a month during the school term, and each theater as often as ordered to inspect by the fire marshal. On top of all this inspection the fire marshal and his assistants conduct a continuous educational campaign. They speak at meetings of school children, civic and community gatherings and



PLASTER REMOVED (JUST ABOVE PANTRY SLIDE) AND HOLLOWED BOARD INSERTED BETWEEN LATHS AND FILLED WITH OIL.

church meetings on the fundamentals of safeguarding property and lives. Fire Marshal Stevens has addressed about 45,000 school children during the past ten months.

In inspecting a dwelling the deputy fire marshal examines the chimneys for defects, the electric wiring, the gas connections, the method of handling ashes and rubbish, the condition of stoves, ranges and furnaces, the storage of oils and the condition of electric fixtures. During the inspection he informs the housewife about handling matches, rubbish and stoves and gives suggestions for lessening fire hazards. Where defects are found which cause fire hazards, the owner of the premises is asked to correct the trouble. A note of the conditions and the request is made, and in a week or so the inspector returns for a second inspection. If a correction has not been made, he reports the facts and conditions in writing to the fire marshal and the case is given special attention. If the owner refuses to comply with the inspector's request, a complaint is made in writing to the fire marshal, who writes to the owner, enclosing a copy of the city ordinance pertaining to the condition which has been ordered altered. A copy of the letter goes to the office files and another copy to the inspector who made the complaint. A card index system is kept so that at a glance the status of the case may be ascertained. The inspector makes occasional inspections after the letter has been sent to the property owner and if the order is not complied with in a reasonable time an arrest is made.

By this system of inspection all kinds of fire hazards have been eliminated. Much has been done in the bettering of wiring conditions, removal of moss from roofs, methods of handling ashes and rubbish and the general conditions about houses and buildings. Theater inspection has caused great improvement in safeguards. A signal has been devised which, when tapped over the fire alarm telegraph to all the stations in the city, sends the inspectors all out on a general theater inspection. These inspections are made while the performance is on and at unexpected times. The inspector in uniform goes directly from his station to the theaters in his district and examines the heating apparatus, the exits, the operating room and other parts of the building. Reports are made four times a month on the findings. The fire marshal is required by ordinance to pass upon the construction of all theater buildings and he sees that they are properly safeguarded before being occupied. The periodical inspection minimizes the danger of the safety devices being out of order.

In schools, fire drills are held often. The inspector drops into the building at an unexpected moment and sounds a fire alarm. The children are trained to march out orderly. Occasionally the fire department is called to the scene to get the children accustomed to its coming. Outside exits have been constructed on all school buildings as a result of the campaign.

The arson squad consists of captains W. A. Groce and F. W. Treese and lieutenant F. W. Roberts. In case of a fire where it is not possible to tell the cause, the captain of the company working at the fire reports at once to one of the members of the arson squad and he goes to the scene and takes up an investigation. Usually members of the squad are on the ground before the fire is over, unless the cause is certain without investigation. A photographer (also a fireman) is subject to call at all times for recording fire scenes and arson evidence. These pictures have been of material assistance in prosecutions. Also pictures are taken to show the causes of fires. These are made a part of annual exhibits.

In the case of one recent fire, the arson squad was at

the scene ten minutes after the fire started and within half an hour had witnesses before the district attorney. Nine arson convictions have been secured and several of the persons convicted have been sent to the penitentiary. The work has resulted in the breaking up of three distinct arson rings.

Among the results obtained by the campaign has been the elimination of false alarms. The fire department, before the campaign, had a great deal of trouble with false alarms turned in both by telephone and through the alarm boxes. In 1914 there were 187 such alarms. Fire marshal Stevens started a crusade against this, with the result of several arrests and convictions. During the entire ten months since this fight was started there have been but eleven false alarms, and every one of these has been run down and the offenders punished.

The deputy marshals attend weekly classes, which are lectured to by experts in fire prevention work. Experiences are related and suggestions given which result in much good for the general cause.

The fire inspection work is backed up by a strong ordinance passed by the city council. Following are some of the principal provisions of this:

Section 2. It shall be the duty of the fire marshal, by himself or assistants, to enforce the provisions of this ordinance and all other ordinances pertaining to the protection of the city from fire.

Section 3. The fire marshal and his assistants shall have the right to enter upon any premises at all reasonable hours for the purpose of inspecting the same.

Section 4. It shall be unlawful for any person or persons to deposit any ashes, cause the same to be deposited or placed, or to permit or suffer the same to be or remain in any wooden vessel or receptacle, or any vessel or receptacle composed or made up of combustible material; but said ashes shall be placed and kept in some vessel or receptacle of galvanized iron or other incombustible material and not less than two inches from any woodwork, or deposited on the ground not less than 10 feet from any wooden building or structure.

Section 5. Any person making, using or having the charge or control of ashes, hay, straw, sacks, bags, litter or any combustible waste material or fragments, shall at the close of each day cause the same to be securely disposed of or removed so as to be safe from fire.

Section 6. All receptacles for waste, rags, paper and other substance liable by spontaneous combustion to cause fire must be made of incombustible material.

Section 7. No explosive or inflammable compound or combustible material of any kind shall be kept, stored or placed near any doorway or stairway of any building or used in such place or manner as to obstruct or render egress hazardous in case of fire.

Section 8. It shall be unlawful to allow or permit to remain upon any roof any accumulation of paper, hay, moss or other inflammable or combustible rubbish or material.

Section 9. The fire marshal shall make an investigation of the cause, origin and circumstances of every fire occurring in the city of Portland by which property has been destroyed or damaged and shall especially make investigation as to whether such fire was the result of carelessness or design. Such investigation shall be begun immediately after the occurrence of a fire.

Section 10. The fire marshal shall inspect all buildings upon which any fire escape may be erected, shall see that it is kept in good order and repair, and it shall be unlawful for any person to place any incumbrances of any kind upon any fire escapes or passages constructed or intended for the escape of persons in case of fire.

#### DISPOSAL OF ANIMALS AND CONDEMNED FOOD IN NEW YORK.

In our issue of July 8th, 1915, we published a description of the plant at Barren Island, New York, in which is performed the reduction of the garbage and offal from that city. In the monthly bulletin of the New York City Department of Health for December is an article by Dr. Joseph A. Shears, giving some more details of the operation of this plant; which incidentally repro-

duces (without credit) the diagram prepared by us showing the details of the process. The following further information is found in this article:

Condemned canned goods, foods, meats, vegetables and hotel garbage are taken care of at this plant; also large and small animals. The number of dead horses so disposed of in 1914 averaged 41 per day, the number having been steadily decreasing from 54 per day in 1911. In addition, the plant treated in one year more than twelve million pounds of poultry, game and fish, vegetables, eggs and other condemned food materials. The bones of animals are sawed into proper sizes, dried and sold for manufacture into buttons, knife handles, etc. Hair, tails and manes are sold for use in high-class upholstery and bedding. Vegetable matters are treated with the garbage in the reduction plant.

At the fish rendering plant the fish are fed into horizontal cylindrical cookers to which steam is admitted through internal perforated pipes. The cooked fish are discharged at the opposite end of the cooker, carried by conveyor to a large drainage and storage room, and after draining are pressed and dried in steam dryer, this dry tannage being sold for fertilizer. The oil from the cooked fish is collected and refined.

### STREET TRAFFIC REGULATION IN BOSTON.

W. B. CONANT, Concord, Mass.

The recent inauguration of improved and systematic methods of handling street traffic in Boston, Mass., has already resulted in a greatly increased movement of vehicles and the enhanced safety of foot passengers at important corners and crossings. About 130 patrolmen of the police force are detailed to traffic work in the daytime, and at night between 15 and 20 patrolmen are assigned to traffic regulation in the down-town section, some of them temporarily after the theatres. The hours observed by the day force are from 7:45 a. m. to 6 p. m., with 1¼ hours out for lunch, and night men are on duty 7 hours, or from 6 p. m. to 1 a. m.

A system of signals was formulated by Capt. Patrick F. King, of Pemberton Square Headquarters, which have been in use several months with gratifying results. The signals are as follows:

#### Signals Used at Crossings, Boston, 1915.

An officer assigned to crossing duty should stand in the center of the street and face the crossing about two feet from it.

Give signal in time so that a person wishing to cross or the driver-operator of a vehicle will know just what they should do, stop or move.

To stop vehicles coming behind the officer on his right, raise and extend right arm full length, shoulder high, and palm of hand to the front, glance over right shoulder to see if vehicles are stopping or slowing down; then look toward sidewalk and signal horizontally with right hand extended from first position for persons to cross.

To start vehicles again bring right arm and hand to first position, glance over right shoulder and signal horizontally forward.

To stop vehicles coming in front and left of the officer, raise and extend left arm full length, hand as high as head inclined to the front, palm toward vehicle, when vehicle stops or slows down, glance toward sidewalk and signal horizontally with left hand extended shoulder high for persons to cross.

To start vehicles again, left arm and hand to stopping position with palm of hand to rear and signal forward.

To notify persons to remain on sidewalks for vehicles to pass, raise and extend either or both arms full length, shoulder high, palm or palms toward sidewalk, glance toward same, then bring hand or hands to above described positions and signal for vehicles to pass.

To stop vehicles coming in both directions, bring the hands and arms to above described positions for stopping vehicles, when they stop, extend both arms and hands as before described for persons to cross and signal as before described for persons to cross from both sidewalks.

To stop vehicles on intersecting street, raise either or

both arms and hands as high as head inclined with palm or palms toward vehicle, glance toward same and when stopped, signal other vehicles forward.

To start vehicles again on intersecting street, raise either or both arms and hands to above described positions and signal horizontally for vehicles to move in the direction they are going.

Officers should use their own judgment about stopping vehicles to allow one person to cross if the vehicles are numerous.

They should do likewise in regard to stopping heavy laden vehicles.

Do not take a person by the arm or hand while they are crossing, except a small child, an aged, or an infirm person; should they have an attendant let the attendant care for them while the officer clears the way.

Officers assigned to traffic streets should confine themselves to its center and part made narrow by vehicles stopping and see to it that any vehicles wishing to pass may do so.

Some places require certain methods in handling traffic, but all must use the above described signals; and officers should develop speed in signaling and not be slow or deliberate.

Two traffic semaphore signals have been put in operation at Tremont and Winter streets and at Massachusetts and Huntington avenues. Each semaphore is in charge of a crossing policeman and must be observed by both pedestrians and vehicle drivers. The signals stand on bases, 11 feet above the street level, being erected on small islands in the center of the street. The manufacturer furnished the apparatus on trial, and if found desirable the street and police commissioners will purchase several semaphores for the regulation of downtown traffic.

In this connection, the streets have been laid off in "safety zones" by the painting of white and red lines across the pavement. Parallel white lines 10 feet apart provide a defined "crossing," while back of the outer line, 6 feet distant, is a parallel red line to define the limit to which vehicular traffic can go until signalled forward.

### ACTIVATED SLUDGE METHOD IN ENGLAND

Recent Experiments in This Method of Treating Sewage at Salford, England—Duration of Aeration, Winter Operation, Possibility of Continuous Flow.

The activated sludge method of sewage treatment was, as readers of Municipal Journal have been informed, originated in the sewage works and laboratory of Manchester, England, and the first experiments were carried on in that country, in Manchester and also at Salford and a few other plants. During the last fifteen months, however, considerably more practical experimental work on this method of treatment has been conducted in this country than in England, largely because of the European war. In a recent paper before the Association of Managers of Sewage Disposal Works, W. H. Duckworth, manager of the Salford sewage works, described the experiments which had been conducted at that plant for twelve months previous to November, 1915. In this paper he stated: "The great European war has overshadowed everything in this half of the globe and has very effectually precluded us from making that progress with these investigations which, under normal conditions, we should have been able to make. Fifty per cent of our men have joined His Majesty's forces or gone on munition work, and the general inability to obtain anything in the way of machinery or castings because of munition requirements has been a very substantial bar to our progress."

In spite of this handicap, experiments were continued at the Salford works, the principal object of which was

to determine whether the time of aeration could be reduced below three hours; whether the results of summer and autumn could be continued through cold weather; whether the open jets in the bottom of the tank used for introducing air would become clogged and what period of time would elapse before this occurred; whether the quantity of air required could be curtailed by modifications in the tank bottom; whether continuous flow was a possibility; and whether the whole method was an economical possibility.

The tank which was used was in two sections, each 90 feet long by 9 feet wide and about 4 feet 6 inches deep. A 12-inch cast iron pipe brought air from the air engine to the bottom of each tank, where it fed two horizontal 9-inch pipes which were reduced to 6-inch and finally to 4-inch, this pipe occupying the long axis of the tank. On each side of this and at right angles to it were 2-inch pipes with tapering side branches fitted with  $\frac{1}{8}$ -inch brass jets for the distribution of air. The tanks have been used continuously on the fill and draw method, operated by syphons; the ordinary time of filling having been one hour, blowing air from one to three hours, lying quiescent two hours and later one and one-half hours, and running off one hour. The three-hour blowing was continued for a time at first, and was reduced to two hours and continued at this rate for several weeks with results apparently as good as during three hours aeration. The period of aeration was then reduced to one and one-half hours and the results obtained were quite as satisfactory as with two hours. In each case the per cent reduction of albumenoid ammonia and of oxygen consumed in four hours was between 70 and 85 per cent. Following this the time of aeration was reduced to one hour, with a reduction of albumenoid ammonia of 75 per cent and of oxygen consumed of 88 per cent.

Up to the time of changing to one hour aeration, the effluent had been bright and clear with only slight traces of suspended matter. In one hour's aeration the effluent had a slightly opalescent appearance, although quite a number of samples were quite clear. The average nitrates in the effluent were 0.485 with two hours' aeration, 0.404 with one and one-half hours, and 0.269 with one hour; showing considerably less oxidation in the last case, which was considered to be an indication that the reduction in time could not be carried much further. The table of results with one hour's aeration, as presented by Mr. Duckworth, is given herewith:

	No. of samples analyzed.	Highest figure.	Lowest figure.	Average.
Free N.H. crude sewage .....	40	3.15	.46	1.79
Free N.H. effluents .....	72	2.05	nil	.615
Alb. N.H. crude sewage .....	22	1.05	.20	.569
Alb. N.H. effluents .....	36	.30	.10	.142
4 hours oxg. crude sewage .....	22	13.35	2.33	6.87
4 hours oxg. effluents .....	36	1.25	.60	.86
Nitrates in effluents .....	36	.656	.065	.269
Percentage purification				
Alb. N.H. ....	84	10	75	
4 hours oxg. ....	92	53	88	
Temperatures crude sewage ....	11	75 F.	62 F.	68 F.

From these experiments the author concluded that it would be perfectly practicable to reduce the aeration to one hour. Even with this, he obtained remarkable clarification approaching the clearness of drinking water on holidays and Sundays and at other times when there was no trade waste, which leads him to believe that probably,

where only domestic sewage is treated, the time of aeration might be reduced still lower. Sewage at Salford contains from 3,000,000 to 4,000,000 gallons of trade waste per day, a considerable portion of which is from tar distillation and ammonium sulphate works, these coming to the plant in large quantities without warning at any time, day or night. As no bacterial life can withstand the action of trade wastes of this nature, all purification systems depending upon bacteria would suffer from the introduction of such trade wastes. Mr. Duckworth, however, believes that his experience shows that the activated sludge very quickly regains its efficiency after such trade waste has entered the tank and only needs a little extra blowing to get matters into normal condition again.

As to the effect of cold weather, the experiments on two-hour and one and a half hour aeration covered the coldest part of the year; and during this time the lowest recorded temperature of crude sewage treated was 51 degrees F. (He does not give the air temperature during these or any other experiments.)

As to the stopping up of the jets, at the time of preparing the paper (the latter part of November, 1915) probably 90 per cent of the jets in one section were stopped up and something less than that number in the other section. The results were still good, however, and this leads him to believe that the amount of air required for purification is a great deal less than they have been using and that modifications could be made in the tank bottom which would permit of using a much smaller number of jets and a correspondingly less quantity of air. (The amount of air used was not given and probably was not measured.)

Continuous flow treatment was tried in a tank 50 feet long, 9 feet wide and 4 feet 6 inches deep, the air being applied in this tank as in the other experiments. Four wooden barriers were placed at equal distances in the tank and about two feet from the bottom and extending above the surface. There were also four settling chambers with bottoms in the form of inverted cones, these four tanks having a total combined capacity of 6,000 gallons. A pump was arranged to remove sludge from any one of these four tanks and pump it back to the incoming sewage. "Those who are acquainted with activated sludge know that it is a well-flocculated substance which settles readily and leaves a line of demarcation between sludge and supernatant liquid as clear and well defined almost as mercury and water. . . . The whole of the effluent flows through the four settling tanks, but the first two are generally sufficient to give us all the settlement required and while, when treating the larger quantity of sewage, we pump the bulk of the settled sludge from these two back to the beginning of the aerating chamber, each for five minutes per half hour, the remaining two only require pumping back for about two minutes per week. Usually there are only a few inches of sludge at the bottom of these conical tanks at the end of a week's working. This means that, with an aeration tank of 12,000 gallons, a settling tank of 3,000 gallons is sufficient, or one quarter of the capacity of the aerating tank. This we consider is an important point ascertained, and this result may easily be surpassed by others in later experiments with variations in design."

The best results obtained at Salford were when working with 20 to 25 per cent of sludge, the excess being usually pumped to the drying area from the first and second settling tanks twice a week.

From the comparatively small effect of the sterilizing trade wastes, it is concluded that "The influence of sterilizing substances which play such havoc with bacteria beds generally can readily be overcome."

## DIAGONAL THOROFARES

### Treatment of Oblique Angles Desirable for Certain Classes of Stores and for "Show" Residences— Examples From Several Cities.

In the two previous articles of this series the advantage of diagonals was discussed from a mathematical standpoint. Additional advantages are that the addition of diagonals, by doubling the number of main thorofares leading to the center, alleviates or prevents congestion along the thorofares (but may increase it at the center, as already discussed.)

Diagonals increase the amount of light and air admitted to the business district, where the crowding of tall buildings and congregating of people make this especially desirable.

Among the objectionable features of diagonals, that of inconvenience and danger to pedestrians was shown last week. Perhaps the objection, among those advanced, that seems most weighty at first thought, next to the cost of the additional street area, is the formation of oblique angled building lots at the intersection; but this is seldom serious in practice, as the following consideration will show.

Acute angles will often bring even higher rental per square foot than other corner property, being adapted to stores for the sale of articles not bulky and in popular demand, such as cigars, newspapers, drugs, groceries, liquor, etc., and they have more frontage per square foot of area than a rectangular corner lot. They also furnish excellent locations for small parks. By cutting across the angle, a building front can be obtained of any width desired, facing obliquely down the street and having an unusually good view of it and standing prominently in view from it. The small triangular plot cut off by such a construction may be used for shrubbery, a fountain or other ornamental feature as an additional attraction.

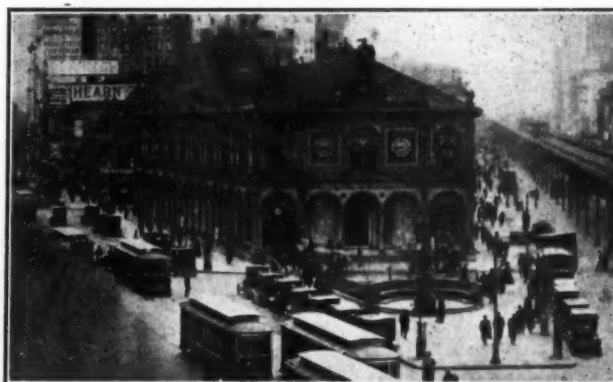
Several such methods of treatment are illustrated in the accompanying sketches and photographs. The Flatiron building in New York and the corners in Muskegon, Danville, Paris and Montclair show acute angles more or less flattened at the angle, while an obtuse angle (the Fifth Avenue building) is seen at the right of the Flatiron building.

In residence sections, such a corner furnishes an excellent location for a more or less imposing house, with the angle utilized for flowers, shrubbery and other ornamental features. It is also a favorable location for churches; while the small drug store, corner grocery, cigar store and news stand, "poor man's club" and other places of

retail trade which are found scattered at intervals throughout every residence section find in the angle at the junction of two thorofares their most favorable location.

In some cases the corner of an acute angle is cut back and rounded to facilitate the turning of the corner by vehicles. When the traffic is at all heavy this is not desirable, but it is better to provide a cross street between the thorofares a short distance from their intersection and encouraged traffic to use this, rather than add to the congestion at the junction, by leaving the angle sharp and awkward to pass around. (See Fig. 3, issue of January 27.)

The application of the principles outlined in the preceding articles to problems encountered in practice will be considered in the next article.

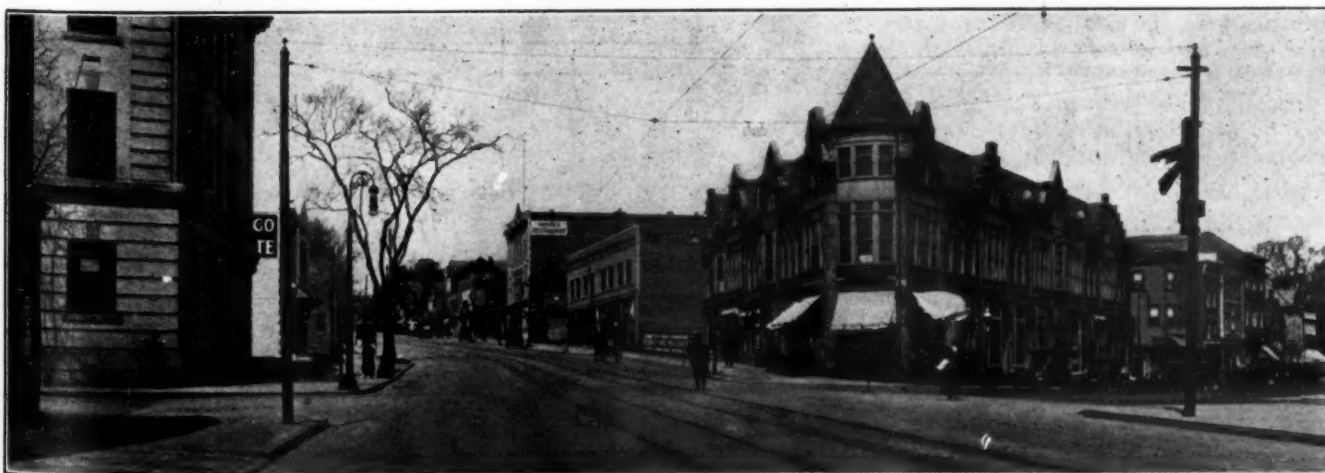


HERALD BUILDING, NEW YORK.  
Paved area, small park and statue in angle between streets.

Above is the treatment of an acute angle (about  $22^\circ$ ) in a large city; and below, that of a less acute one in a town of 21,000 population. The two thorofares intersecting beyond the foreground in the picture, in front of the Herald building (Broadway and Sixth Avenue) are two of the heavily traveled streets of the city. There are several cut-offs between the two, one just in front of this building, another in its rear, so that no traffic between the two thorofares passes around this point of intersection. Here we have the point cut off, forming a small park or open space.

The lower picture shows the junction of the main street (an important county highway) and a street leading to the railroad station entrance. The large building occupying the corner is used for stores and offices. There is a cut-off beginning at the extreme right edge of the picture and emerging well in the background, which can be developed to the advantage of traffic by grading and paving, whenever traffic at this corner shall become sufficient to demand it.

Further examples are given on the following page.



Courtesy, Granite Paving Block Manufacturers' Association.  
ACUTE ANGLE AT MONTCLAIR, N. J. DRUG STORE ON CORNER.

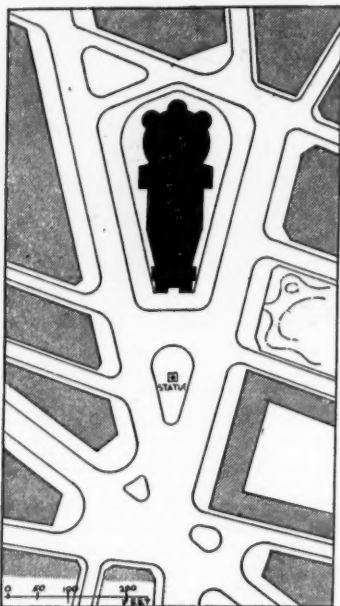


PLACE ST. AUGUSTIN, PARIS. CATHEDRAL.

On the left is an acute angle, about  $26^\circ$ , in a large city, occupied by a cathedral; on the right, about the same angle in a small city is occupied by a church; in both cases an excellent use of this prominent position. Below are two acute angle buildings, both occupied on their ground floors by cigar stores. The Flatiron building comes nearly to a point.

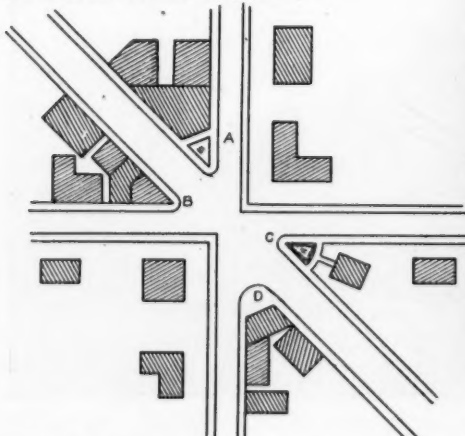


ACUTE ANGLE AT DANVILLE, VA., CHURCH.



PLACE ST. AUGUSTIN, PARIS.

Below are several treatments of acute angles. A shows a small park, as at Herald Square, New York. B is like the Flatiron building. D is cut back, but without a park, the surplus area being thrown into the roadway and sidewalk, as in the Muskegon example above. C shows a residence property with the point laid out in lawn and gardens and an entrance on each street. (The other two corners should be slightly rounded to facilitate passage from the rectangular streets to the diagonal.)



TREATMENT OF OBLIQUE CORNERS.



Courtesy Barber Asphalt Paving Co.

ACUTE ANGLE IN MUSKEGON, MICH.  
Corner Cigar Store.

OBLIQUE ANGLES IN NEW YORK.

Flatiron building, filling an acute angle. At the right, the Fifth Avenue building filling an obtuse angle.

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## CHANGE OF ADDRESS

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Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

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FEBRUARY 10, 1916

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### Concrete Work During Freezing Weather.

That concrete and other masonry work can be conducted successfully during freezing weather cannot be disputed. That it is not desirable to do so except for urgent reasons would also seem to be indisputable. Almost all of the locks and other masonry work of the old Erie canal were built in winter in a climate colder than some parts of Canada (this being really reconstruction work, which could be done only after the canal was emptied for the year), and with uniform success.

As to the most successful methods to be employed, however, there is room for discussion and for improvement. There would seem to be three general principles to be employed—(1) having all materials which are used warm when they are placed in position; (2) using materials in the mortar which will delay freezing; and (3) protecting work until the mortar has set. On the Erie canal work referred to, reliance was placed almost exclusively on the use of brine for mixing the concrete; but this practice has been largely abandoned on all work and warming materials and protecting the work are now relied upon.

Warming stone, sand, gravel, etc., is generally accomplished by burning wood, we believe, the appliances be-

ing crude but probably fairly efficient. Another method using steam is described in an article in this issue. (Incidentally, we wonder whether the condensed steam in the gravel pile might not freeze if allowed to stand too long, and produce a mass difficult to break up.) Exhaust or other steam is commonly used for heating the water used for mixing concrete or cement.

It is in the matter of protection, however, that there would seem to be most room for improvement. The loss of heat by convection in the open air is much greater than that by radiation in a quiet atmosphere. Unchanging air is a fair non-conductor of heat, and a masonry structure surrounded or covered by canvas with an air space between the two of a foot or two (more may be necessary for working) would conserve a large part of the heat which was in the material when placed, and would in many cases retard freezing for several times as long a period as if the fresh masonry were exposed to the open air. In our January 20th issue we told of a bridge of 20-foot span which was built under a large tent with this idea in view; and we believe that a tent for housing the concrete mixer, distributing the concrete in large mass (as by bucket on boom) or by a short spout (not by tower and long spouts), and keeping the work enclosed by canvas or covered by manure or other non-conductor, would add greatly to the success of such work in cold weather. The essential requirement is to prevent the air in contact with the work from removing itself bodily into the atmosphere and being replaced with fresh cold air.

In trench work, light frames covered with canvas, or even with burlap, could be placed across the top of the trench and moved ahead as the trench progressed, while a canvas curtain could be hung at each end of the work. The sewer or other pipe being laid could be stopped at the lower end to shut out the air. Some air must, of course, be admitted for the workmen, but there will generally be sufficient leakage for that. Even if these are not used by day, the thorough shutting in of the trench at night would protect the work and also prevent freezing of the freshly-exposed soil and thus preclude the necessity of removing a frozen top crust in the morning when excavation is renewed.

### Fire Prevention by Inspection.

The remarkable success of Portland's fire marshal in reducing the number of fires by nearly one-half in one year's campaign cannot, perhaps, be equaled by every city which takes hold of the matter for the first time in a thorough manner, but it demonstrates the efficacy of proper inspection by an organization of the firemen kept continuously and systematically at the work. It will be noticed that inspection was only the beginning, however. Offenders were followed up until objectionable features were remedied; arson cases were thoroughly investigated and the criminals punished; school drills are held under the fire marshal's supervision, and the whole campaign has the support of the council.

### Grading and Paving Costs.

Through an oversight there was omitted from the foot-notes of Table 2A in last week's issue the statement of what the index letter "g" was intended to signify. As in Table 2B, it was to indicate that the price of paving given included grading or excavation.

As stated in that issue, we think it extremely unfortunate that so large a percentage of cities include grading in the price. One engineer did not furnish any prices because, he said, it was difficult to determine the average price since costs varied with the amounts of grading. We wonder how he estimates the cost of proposed work.

There are, we are glad to learn, hundreds of cities which do not include grading in paving costs. Of the total of 1,471 paving costs given last week, only 667 were reported as including grading. Most Iowa cities and several others follow the practice of allowing separately for excavation for all depth in excess of the thickness of the pavement to be laid. This is certainly better than no allowance, but it does not provide for variations in depth within that limit or for cases of no excavation at all (as in repaving), nor for differences in cost of excavating dirt, macadam and other substances.

Would a railroad receive bids per foot for track construction which included cuts, fills, tunnels, bridges and all other work connected with the right of way? We never heard of such, but lumping all kinds of street work under the one head of pavement yardage is even more absurd.

### GENERAL PAVING NOTES.

The Following Items of Information, Not Subject to Tabulation, Were Furnished by City Officials in Connection with the Data Published Last Week.

In Trenton, N. J., repaving with vitrified brick on an old macadam base, using cement grout filler, cost \$1.55 per square yard by contract, this including the removal of the old brick. Repaving with bituminous concrete on an old foundation cost 65c per square yard by contract, this including a five-year guarantee and the removal of the old material.

Work contemplated in Plattsburgh, N. Y., will be mostly vitrified brick but Durax granite will be used on a hill and wood block on a bridge.

In Sewickley, Pa., about \$25,000 was spent in repairing tar and asphalt streets which had been neglected. Tarvia B was applied to several streets at an average cost of 4½c per square yard. Tarvia A and Tarvia X were used in resurfacing rough streets and bad holes. A thin layer of tar was spread where the pitch was to be placed and then covered with silica gravel and slag screenings and these were then rolled with an 8-ton roller. This work was done at an average cost of 12c per square yard and has proved to be an economical method of maintaining old macadam streets.

Morristown, Pa., laid 760 square yards of macadam in which slag only was used. It is the intention to add bituminous cement to this during the coming summer. Some waterbound macadam was laid which was not finished until January 4th of this year. This also will receive Tarvia treatment during the season. Both these were done during cold weather because of the pressing necessity for surfacing on these streets.

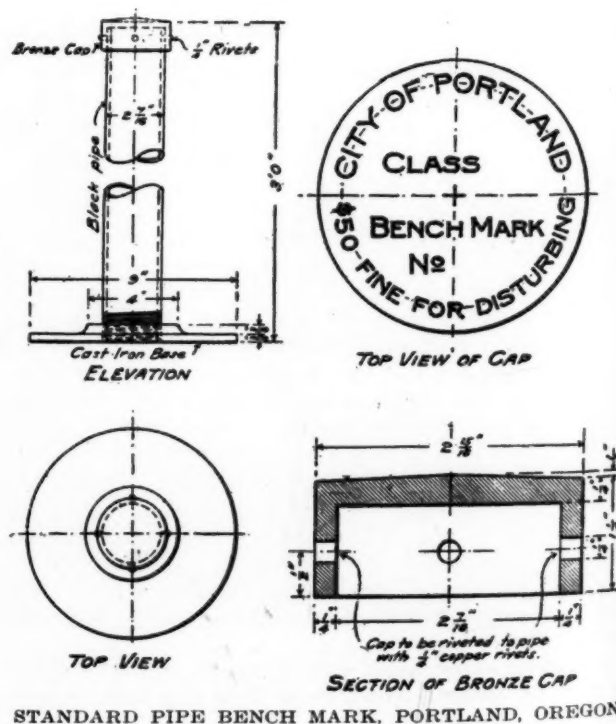
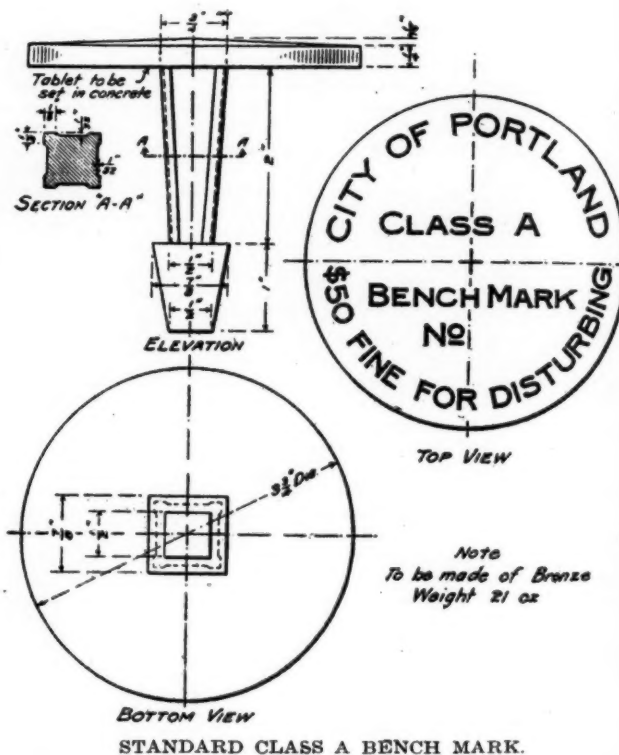
### BENCH MARK HANDBOOK.

For the convenience of engineers, contractors, surveyors and others, the city of Portland, Oregon, has just completed a bench level survey of the city and has issued a booklet giving a tabulation of each of the 2006 bench marks, showing its exact location and its elevation. The booklets are for free distribution. This is said to be the first published tabulation of the kind in the United States.

For convenience, the bench-marks, as established by a survey conducted last year to replace all old and in some cases inaccurate bench-marks, are divided into three classes, based mainly on permanency. Class A marks, which are large sized bronze tablets or iron pipes set in concrete or a concrete footing, are considered the most permanent; Class B marks, which are smaller bronze tablets and some iron pipes without concrete, are less substantial and more liable to displacement than Class A; while Class C marks are semi-permanent and are not marked and not so easy to identify as the others.

Prior to the establishment of the present system, contractors and others had much difficulty in finding monuments and bench marks. Under the new system the contractor has but to refer to the printed booklet to find the exact location of the bench marks in any locality he may desire.

The bench marks are laid out according to a general system. The city is divided into eight districts and the marks in each district are listed by the north and south streets as far as possible. The north and south streets are taken in succession from the Willamette river (which courses the center of Portland) outward, and the bench marks on each are taken in a certain direction for each district. The same system is followed as to east and west streets, taking a central line as the base.



STANDARD PIPE BENCH MARK, PORTLAND, OREGON.

# The WEEK'S NEWS

Good Roads Education in Tennessee—County Planning in Wayne County, Mich.—Mortality Statistics of the United States—Ohio's Campaign for Industrial Safety—Want New New York Water Supply—Beaumont, Tex., and St. Paul Water Departments—Control of Water Power by States—Business Section  
Fires—Economy Program in Boston—The Smoke Ordinance of Des Moines—The Ravages of the Floods—New Housing Law in Massachusetts.

## ROADS AND PAVEMENTS

### Good Roads Institutes in Tennessee.

Nashville, Tenn.—Three good roads institutes, or conferences of road officials are to be held in Tennessee during the month of February. The first will be held at Knoxville, February 15 to 18, the second at Nashville, February 22 to 25, and the third at Jackson, February 29 to March 3. The conferences will be held under the direction of the State Department of Highways, with the co-operation of the University of Tennessee and the U. S. Office of Public Roads. Each county in the section of the state in which the conference is held is urged to send at least one road official to the conference and as many others as can attend. All interested in better roads are invited to attend the conference to hear experts on road building and maintenance discuss the various features of the work. Among the speakers will be A. D. Williams, state highway commissioner of West Virginia; W. S. Keller, state highway engineer of Alabama; Robert C. Terrell, state highway commissioner of Kentucky; J. J. Murray, secretary, and A. M. Nelson, state highway engineer, of the state department of highways of Tennessee; Prof. Ferris, dean of the engineering department of the University of Tennessee, and others. In addition to the addresses of these and other speakers of note general discussions will be had by county road officials in the state who will talk on road problems in their respective counties. The question of a uniform system of accounting in the expenditure of road funds will also be considered. The conferences will be under the direct charge of Prof. Ferris. The Office of Public Roads at Washington will send government engineers to aid the other speakers at each conference.

### Railway Company Wins Paving Suit.

Milwaukee, Wis.—The city cannot compel the street railway company to pave between some parts of its tracks under the ordinance of July 11, 1892, according to a decision rendered by Judge Eschweiler. The question at issue was whether the ordinance passed in 1892 authorizing the extension of the street railway on Sixth avenue south from Greenfield avenue should be construed as carrying with the obligation to pave between the tracks in accordance with an ordinance passed May 29, 1865. The court held that the later ordinance, under which the action was brought, did not include the provisions of the 1865 ordinance and contained no provisions expressly obligating the street railway company to the conditions set forth in the earlier ordinance.

### Decision in Road Maintenance Case.

Knoxville, Tenn.—A judgment of \$5,527.35 was awarded the city of Knoxville against the Southern Paving & Construction company, of Chattanooga, in federal court. The suit was brought by the city to recover damages resulting from alleged faulty construction of pavement of Park avenue. The testimony in the case tended to show that this pavement had disintegrated and broken within the period covered by the defendant's maintenance bond. This bond expired in 1915, but owing to the fact that no settlement for damages nor payment for repairs could be secured from the defendant by the city before the expiration of the bond the action for damages was begun. The defense endeavored to lay the responsibility of the damaged pavement upon the Knoxville Railway & Light company, asserting that the

sinking of the tracks of this company caused the pavement to crack and that water found its way into these cracks and under the asphalt, causing it to disintegrate. The plaintiff alleged that the contracting company was responsible for the condition of the paving regardless of what caused it to become damaged. Officials of the city engineering department say that the street can be fairly well repaired for approximately \$6,000. The city sued for \$33,000, which would have covered the cost of an entirely new pavement and interest on the money invested in a third of the paving, to which it claimed to be entitled because it was deprived of the use of this third of the highway on account of its faulty construction, and damages resulting from the general inconvenience to the citizenship. Judge E. T. Sanford, in his charge to the jury, did not refer to the interest on the investment nor the damage feature of the city's claim, but gave a broad presentation of the case in general.

### New Chicago Bridge Opened.

Chicago, Ill.—The new \$425,000 Jackson boulevard bridge is open for traffic, after many unforeseen delays. Traffic congestion on the adjacent streets has been greatly relieved. The old swing bridge was removed and has been replaced by a new modern bascule bridge by the sanitary district of Chicago under the act of the general assembly of the state, empowering the district to remove obstructions from the Chicago River. The rebuilding of this bridge has been a subject of controversy for many years, the sanitary district trustees desiring a span that would cause no obstruction in the river, while the railroad companies owning property on the west side of the river refused to permit any encroachment on such property on the ground that it would make impracticable the proposed new Union terminal station. After much discussion between the various interests an understanding was finally reached in 1912. The bridge is 274 feet long from end to end and consists of two movable leaves, one 123 and the other 128 feet long. The roadway on the bridge is 37 feet wide between curbs and is paved with creosoted wood blocks resting on a floor of six-inch creosoted planks. The two sidewalks have a width of 13 feet each from curb to railing, and the entire bridge is 64 feet wide.

### Test Hillside Paving.

Summit, N. J.—An interesting experiment is being made by the Union County Board of Freeholders to determine the type of road best suited to hill traffic under certain conditions. Brick, concrete and amiesite are being tested by County Engineer Jacob L. Bauer. "Hillside brick" is used. The grade of the Morris avenue hill is nine per cent.

### Money Saved by County Planning.

Detroit, Mich.—Two million dollars has been saved to Wayne county since August 26, 1915, and the county has been assured a well defined plan instead of a haphazard jumble, by enforcement of the amended state act governing the making of plats, according to William Gutman, chairman of the board of county auditors. The \$2,000,000 was saved by avoiding future suits for the opening of streets and alleys, which would have cost the county the amount estimated, if the old system had continued of allowing real estate men and others free play in the laying out of subdivisions, the auditor said. In order to facilitate the work of planning the county so that all the streets will run to the county borders or to main highways, the board of

auditors in the future will co-operate with the city plan and improvement commission and the Wayne county good roads commission in laying out Detroit's main arteries to the county limits. The city plan and improvement commission will make use of the plats filed with the county auditors, and it is planned to have a rough outline of the main streets of Detroit extended to the county border. This outline will be used by the auditors in granting plats, which must be passed upon by the county auditors before the land is subdivided. Real estate men have complained vigorously.

## SEWERAGE AND SANITATION

### Warned by State Health Departments.

Williamsport, Pa.—The State Department of Health has given notice to the city that it would permit no further temporizing in the matter of the erection of a sewage disposal plant and that unless plans for such a plant were prepared and filed in Harrisburg by April 27 the state would revoke the right of the city to discharge sewage into the Susquehanna river. The communication from Samuel G. Dixon, state commissioner of health, points out that the city has been playing with this question for nearly ten years and making no effort to keep faith with the state, but that now the city must proceed "upon the immediate fulfillment by the city of the fifth stipulation of the permit issued June 10, 1907" and that the plans required must "be completed and submitted to the state for approval within six months." It is ordered that the city shall undertake a study and preparation of plans for the "treatment of all of the sewage now being discharged into state waters" from the municipal sewer system, such plans to be prepared by a competent expert. No roof or other storm water will be admitted to the system herein approved, the sewers to be used as carriers of sanitary sewage only. The right to discharge sewage, untreated, into waters of the state is extended until January 1, 1917, provided that the city complies with the other conditions of the permit within the periods specified.

Somerville, N. J.—Unless the borough of Somerville complies with the orders of the State Board of Health by building a sewage disposal plant, legal proceedings will be instituted by the state attorney general, according to a communication received by the authorities from Trenton. For a number of years the matter as to whether municipalities must construct sewage disposal plants has been in the courts in the suit of the State Board of Health against Phillipsburg. The action was decided in favor of the health board, that it is not optional but compulsory for municipalities to build a sewage disposal plant. As a result of this decision by the courts, not only this borough, but Bound Brook and Raritan will have to comply. South Bound Brook has already commenced building its sewage disposal plant.

### Death Rates in United States.

Washington, D. C.—According to a preliminary announcement with reference to mortality in 1914, issued by the United States Bureau of the Census, more than 30 per cent. of the 898,059 deaths reported for that year in the registration area, which contained about two-thirds of the population of the entire United States, were due to three causes—heart disease, tuberculosis and pneumonia—and more than 60 per cent to eleven causes—the three just named, together with Bright's disease and nephritis, cancer, diarrhea and enteritis, apoplexy, arterial diseases, diphtheria, diabetes and typhoid fever. The deaths from heart diseases (organic diseases of the heart and endocarditis) in the registration area in 1914 numbered 99,534, or 150.8 per 100,000 population. The death or mortality rate from this cause shows a marked increase as compared with 1900, when it was only 123.1 per 100,000. Tuberculosis in its varied forms claimed 96,903 victims in 1914, of which number 84,366 died from tuberculosis of the lungs (including acute miliary tuberculosis). As a result of a more general understanding of the laws of health, there has been a most marked decrease during recent years in the mortality

from this scourge of civilization: In only a decade—from 1904 to 1914—the death rate from tuberculosis in all its forms fell from 200.7 to 146.8 per 100,000, the decline being continuous from year to year. This is a drop of more than 25 per cent. Prior to 1904 the rate had fluctuated, starting at 201.9 in 1900. Even yet, however, tuberculosis has the distinction of causing more deaths annually than any other form of bodily illness except heart diseases, and over 40 per cent. more than all external causes—accidents, homicides and suicides combined. Pneumonia (including bronchopneumonia) was responsible for 83,804 deaths in the registration area in 1914, or 127 per 100,000—the lowest rate on record. The only remaining death rate higher than 100 per 100,000 in 1914 was that for Bright's disease and acute nephritis, 102.4. The total number of deaths due to these maladies in 1914 was 67,545, more than nine-tenths of which were caused by Bright's disease and the remainder by acute nephritis. The mortality from these two causes increased from 89 per 100,000 in 1900 to 103.4 in 1905, since which year it has fluctuated somewhat. Next in order of deadliness come cancer and other malignant tumors, which filled 52,420 graves in 1914. Of these deaths, 19,889, or almost 38 per cent., resulted from cancers of the stomach and liver. The death rate from cancer has risen from 63 per 100,000 in 1900 to 79.4 in 1914.

### Smallpox Prevalent.

Clinton, Ia.—There are 45 cases of smallpox in Clinton, according to Dr. H. R. Sugg, city health officer, who is sending out a warning to the public, urging the necessity of general vaccination. Several weeks ago, at the beginning of the present smallpox epidemic, the public was warned that an epidemic was imminent, and vaccination was urged. This warning has been unheeded by many. About one case in ten is of dangerous character, the balance are about equally divided between moderately severe or mild. The disease is being spread by the mild cases, unrecognized or wilfully not reported.

### Typhoid Surveys by State.

Lansing, Mich.—Flint is to get a survey, following its typhoid epidemic, by state sanitary engineer E. D. Rich. For some months there have been many cases of typhoid in Flint. Several were traced to a supply of milk, which was coming from a "bad" dairy. Since January 1, however, there have been more cases, and the Flint officials have been in communication with the state officers. Dr. Don D. Knapp, local health officer, will co-operate with the state authorities.

State sanitary engineer Rich and his assistant have also been making an extended "typhoid fever" survey of four towns south of the city of Detroit—Ford, Ecorse, Wyandotte and Trenton. For some months the typhoid fever rate reported from these towns has been very high. It is the intention of the engineers to investigate the typhoid cases from every angle. Particular attention will be paid to water and milk supplies.

### Industrial Safety Exhibit Successful.

Cleveland, O.—"If this safety show saves one life, and there is no doubt it will save many, it will have been worth all the trouble and expense involved," said Victor T. Noonan, director of safety for the industrial commission of Ohio, of the industrial safety exposition which has closed its week at the Central armory. "We have had a steady attendance of men throughout the show, employers and employees. The show has done more than merely save lives and limbs. It has brought the laborer and his employer into closer relationship." Companies and safety organizations in Chicago, St. Louis, Pittsburg, New York city and Boston have sent delegations to the exposition here. The safety societies of Toronto, Canada, delegated a number of members to make a study of the exhibits and report. Vice-president C. J. Wright of the Industrial Commission of Ontario, Canada, came from Ottawa for this purpose. Director Noonan expects to conduct safety campaigns in factories of Toledo early in February, under the auspices of the Toledo Board of Commerce. This will be followed by similar campaigns in Cincinnati, Columbus, Youngstown, Akron, Marion, Springfield and Massillon.

## WATER SUPPLY

### Test Constitutionality of Water District.

San Rafael, Cal.—The constitutionality of the so-called municipal water district act of 1911 will be tested by a suit taken direct to the supreme court by the Marin Municipal Water District. The directors will mandamus auditor Dolge, who has refused to sign warrants for the current expenses of the district. According to judge Curtis Lindley and attorney George Harlan, this test will put in issue the constitutionality of the entire act. The directors decided to carry the matter into the courts, following their failure to attract any bids for the \$300,000 block of bonds offered for sale. The directors propose to offer for sale the entire bond issue of \$3,000,000 voted by the people of Southern Marin county last August, in the event the act shall be upheld by the courts.

### Company Cannot Collect from New Tenant.

Harrisburg, Pa.—Public service commissioner William A. Magee, in disposing of the complaint of Hiram G. Chace against the Citizens' Water Company of Canton, gave an unusual opinion on the question as to whether or not a water company may collect from a new tenant or new owner of a dwelling water rent for which the former tenant or owner is delinquent. Anticipating that an appeal may be taken to the courts, Mr. Magee, who was formerly mayor of Pittsburgh, says that if the opinion be sustained it will remove one of the principal causes of irritation between water companies and the public.

### Metering Increases in Salt Lake City.

Salt Lake City, Utah.—Increase in installation of meters by Salt Lake water consumers during last year over the previous year was 73 per cent, according to figures from the annual report of Charles F. Barrett, superintendent of waterworks. According to the superintendent, almost as many meters were installed during 1915 as were previously during the entire history of the city water department. Mr. Barrett declares this is an indication that the people of the city are learning that a water meter is a money saver as well as a water saver, and that the prejudice against use of meters is dying out. There are 2,986 meters in use, and of this number 1,268 were installed during the past year. Under the city ordinances, meters are required only in hotels, laundries, breweries and like places of business where quantities of water are used. There is no ordinance requiring private consumers to install meters, but since his incumbency as superintendent of waterworks, Mr. Barrett has urged private consumers to install meters as measures of economy in conservation of water and cost of service. The report also shows that the actual consumption of water in all of Salt Lake last year exceeded that of the previous year by 9.7 per cent. The average daily consumption last year was about 22,000,000 gallons, while the year before it was about 20,000,000 gallons. The increase last year is attributed by the superintendent to the unusually dry season, which required more water for sprinkling purposes, and to the fact that additional territory had to be supplied with water owing to the extensions of mains and to the taking of more territory into the city. There was an increase of 4.8 per cent in the mileage of mains laid last year, as compared with the mileage the year before, and there was an increase of 4 per cent in consumer services over the preceding year.

### \$22,000,000 for More New York Water.

New York, N. Y.—The Board of Estimate has voted to issue \$22,000,000 in corporate stock to build the Schoharie watershed extension of the Catskill Aqueduct, but action on the matter has been held up because Stewart Browne, President of the United Real Estate Owners' Association, served Mayor Mitchel and the other members of the board with a court order to show cause why an injunction restraining them from taking any action should not be allowed. The mayor said that when the Catskill system is in operation next year there will be a daily water supply

of 656,000,000 gallons. Assuming 3 per cent increase in the consumption of water each year, by 1920 or 1921, the 656,000,000 gallons daily would be needed. By adding the Schoharie watershed, the construction of which would take eight years, the supply would be increased by 250,000,000 gallons daily. Allowing for the same increase of consumption this supply would be sufficient until 1935, he said, by which time additional watersheds would have to be looked for or the pumping stations in Brooklyn and Queens put back into service. Meanwhile, Senator William M. Bennett has introduced a bill at Albany, providing for the abolition of the New York City Board of Water Supply. Senator Bennett, whose bill is said to have the support of the Real Estate Board of New York City, takes the view that with the Ashokan Dam enterprises practically completed the work of this costly board has been finished. Senator Bennett does not believe that the city at present, when its finances are in difficulties, should undertake to acquire an additional water supply from Schoharie county. "The Merchants' Association in its 1906 report said that the second half of the Catskill water project should not be begun until 15 years after the first half was completed, and that by postponing the commencement of this enterprise the city would save \$38,500,000 interest and sinking fund charges. For the last ten years the increase in the consumption of water in the city has been only 55,000,000 gallons in the daily consumption. If we figure that hereafter the average increase will be double, the turning on of the Catskill Aqueduct will give the city ample water supply for forty years to come, and it would seem to be good business to postpone this project for at least ten years, but it seems to be hopeless to get any economy in the present city administration."

### Profitable Waterworks.

Beaumont, Tex.—The municipal waterworks system has proved a profitable investment to the city. It has not only provided the city with an adequate supply of pure and wholesome water, but has earned a net profit during the past year. According to the financial report filed with the city council by the waterworks commission, the plant during the last three months of 1915 netted for the city \$1,905.89. Up to September 30, 1915, the waterworks system had earned a net profit of \$6,178.42, making a total earned up to the beginning of this year of \$8,084.31. In the report it is pointed out that water rates to large consumers were reduced aggregately \$468.34. Had the reduction not been made the plant would have earned during the last quarter \$2,374.23.

St. Paul, Minn.—St. Paul's water department earned \$148,912.57 in net profits in 1915. This is the balance after operating expenses and the fixed charges of interest and sinking fund are deducted from the year's revenues. The whole surplus, with the bills receivable and other items to come in, will be used for improvements this year. The total revenues of the year were \$460,216.20, a gain of \$7,139.86 over 1914. The operating expenses of the year were \$148,146.06 and the interest and sinking fund charges \$163,157.57, which leaves \$148,912.57. There are accounts receivable of \$147,000 and cash on hand of \$103,000, making a total balance of \$250,000. From this is to be deducted \$46,000 in bills payable and advance payments on work and services to be installed, which leaves a balance of approximately \$204,000, which will be used for improvements the coming year. The annual report was submitted by John C. Flanagan, assistant secretary and chief accountant, to the water board, consisting of Commissioners Oscar Keller, M. N. Goss and S. A. Farnsworth. Plans which the water board have for the expenditure of this sum include the laying of fifteen miles of water mains, the purchase of meters and the installation of services for patrons. None of the new bond issue will be used. Last year fifteen miles of new mains were laid, meters costing \$17,000 were purchased, and a large addition to the general office building was erected. During the year, 1,927 new services were constructed. The report shows the cost of the waterworks property to date to be \$6,202,697, with bonds unpaid at this date of \$1,857,000, a reduction of \$100,000 since last annual report.

## STREET LIGHTING AND POWER

### States Have Water Power Control.

Washington, D. C.—In a decision of wide importance to water power development throughout the United States, the supreme court has decided that states possess the power to enact laws authorizing condemnation of power sites and water rights by right of eminent domain. The decision was announced by Justice Holmes in upholding the constitutionality of the Alabama water power condemnation statutes in a case touching the improvement of Tallapoosa River.

### San Francisco Talks to Schenectady About Lighting.

Schenectady, N. Y.—Schenectady and San Francisco celebrated together on a common subject of rejoicing—Schenectady for the completion of its new system of lighting and San Francisco for the one it hopes to have on Market street. During a dinner given by the Schenectady Board of Trade in celebration of its new lights, a long distance telephone conversation was held with San Francisco. W. D'Arcy Ryan, the exposition's illumination expert, who designed the lights being used in Schenectady, spoke at the other end. Talking with Manager G. E. Emmons of the Schenectady plant of the General Electric Company, Ryan told him that Market street, San Francisco, is soon to be the best lighted street in the world.

### San Francisco Fights Light Rates.

San Francisco, Cal.—In its attack upon the rates and rules of the Pacific Gas and Electric Company, the city and county of San Francisco have filed with the railroad commission an amended complaint including a request that the commission hold an investigation for the purpose of fixing just rates to be charged by the City Electric Company of San Francisco and the Sierra and San Francisco Power Company. The complaint charges that all the defendant companies are maintaining excessive rates and also that the defendants are discriminating between the commercial district and the residential district. The complaint alleges that the defendants have adopted the policy of meeting competition in the commercial and industrial sections by making very much lower charges for lighting and power purposes there than the maximum rates established by ordinance, and, that to compensate for inadequate returns from such competitive territory, charges excessively high rates in residential sections. The original complaint was filed by the city on August 9, 1915, and in its answer filed September 25, 1915, the Pacific Gas and Electric Company denied that "it furnished practically all the electricity used in the city for residential lighting purposes," and said it furnished only about 65 per cent of the lighting and power current exclusive of electricity used by railways.

### Towns Lose Gas Rate Fight.

Trenton, N. J.—Finding that the New Jersey Gas Company receives less than six and a half per cent return on the present value of its property, the Board of Public Utility Commissioners has dismissed the complaints of ten municipalities in southern New Jersey alleging that the rates charged by the company are unreasonable. Tracing the history of the organization of the company, which was formed by the consolidation of a number of corporations, the board's report shows a total outstanding capital stock of \$1,975,425. This the board said was in excess of the present value of the property, which was placed at \$1,141,619, as a basis for rate making. The cost of reproduction was estimated by the board's engineers at \$1,258,218, or \$717,207 less than the capitalization. The company claimed that to the valuation of its physical property, as determined by the engineers, there should be added \$458,176 for intangibles. This claim was not allowed by the board, which, however, included \$115,392 for development costs and legal services in fixing the rate making base. The total operating revenue of the company for 1914 was \$182,210, while the operating expenses were \$117,268. The net operating reve-

nues, excluding depreciation, were \$71,942, to which was added \$107 for non-operating income, making the gross income for the year \$72,049. The investigation disclosed that the property of the company is of capacity in excess of that needed to supply its customers up to 1920. Because of this excess deductions were made by the board in arriving at its valuation for rate making purposes. Concluding an elaborate report dealing with the investigation, the board held that the return to the gas company is not in excess of a reasonable return upon the fair value of its property, used in supplying service to the public. It remarks that the fair value thus referred to is the actual value as disclosed by the investigation and appraisal and not the par of market value of the company's securities. The municipalities filing the petition were Mantua township, East Greenwich township, Glassboro township, Wenonah, Pitman, Clayton, Pittsgrove and Woodbury Heights, in Gloucester county; Elmer, Salem county, and Gloucester township, Camden county.

## FIRE AND POLICE

### Business Section Almost Wiped Out.

Galeton, Pa.—Fire wiped out a large part of the business section of Galeton with a loss of \$300,000. The Central hotel, office of the Galeton Leader-Dispatch, the Spiegel Opera house, the Methodist church and a number of business buildings and residences were in the path of the flames. The fire was discovered at about 2 o'clock in the morning, and burned furiously until 6 o'clock. Nearly all of the burned structures were frame buildings and the flames were driven before a heavy wind. The Galeton firemen were greatly hampered by the lack of sufficient water supply. The town has six sources, four springs and two runs, and a storage reservoir of 200,000 gallons. The people had left the spigots in their homes open during the night to prevent the water pipes from freezing and the pumps at the large lumber mills had been in operation, pumping water for several fire streams when it was discovered that the supply was low. It nearly gave out before the flames were under control. Firemen and residents had a number of narrow escapes from being burned and injured, but all escaped. Wire communication with the outside was nearly shut off with the destruction of the telephone exchange.

### East Youngstown's Fire Department.

East Youngstown, O.—An exciting council meeting revealed startling conditions in the village's fire fighting apparatus. It was found that there is but one hose nozzle in the village and not enough good hose to reach a fire 300 feet from a hydrant. The fire engine is out of commission, standing without water in the boiler, while certain parts have been broken and not repaired. It is said the engine can be made to pump water after 30 minutes of work. John Hines, chief of the village volunteer department, declared that the state fire marshal, on his last visit to East Youngstown, gave the village officials 24 hours to get the apparatus into working order and if after that time it was not in good shape he would turn the situation over to the Youngstown fire department. Daniel Ferris, councilman, declared after a motion had been made to authorize the purchase of the necessary equipment for the fire department, that the village had on hand about 2,200 feet of good hose and that it was not taken care of in the right manner. He declared that several hundred feet of the hose is frozen in the driveway to the city building and that pedestrians had been tramping on it for more than ten days. Steps are being taken to make the necessary improvements and also to change the name of the village.

### Fire Sweeps Business Section.

Passaic, N. J.—The worst fire in Passaic's history, which raged through the business section, wiped out a dozen business places and did damage totalling about \$350,000. For a time the fire threatened the entire business section. Most of the buildings on the east side of Main avenue are frame structures. The fire attracted attention from all the nearby

towns and offers of aid came from all, but were refused by Chief Bowker. The fire started in a restaurant kitchen at 2.30 a. m. Engine 1 and Chief Bowker responded to the call and thought they had it out in a few minutes. While the chief and patrolman Charles Farrell were making a further investigation, the flames broke out in an old four story frame building. Chief Bowker sent in a general alarm. The wind blowing from the west, drove the flames to the buildings on both sides and across the street. Police aroused the residents of the block and no one was hurt. Firemen and policemen suffered only slight injuries, although they were in danger from falling walls. For almost seven hours the men fought their good fight.

## GOVERNMENT AND FINANCE

### Advisory Commission on City Efficiency.

Cleveland, O.—All questions of increased efficiency in municipal administration are hereafter to be considered by a committee of fifteen prominent citizens who are to act as an advisory commission to Mayor Harry L. Davis. Following are the members of the committee: S. W. Schofield, architect; A. S. Taylor, V. C. Taylor & Son; George A. Coulton, president Union National Bank; E. A. Roberts, secretary Builders Exchange; Bascom Little, president Chamber of Commerce; Victor W. Sincere, manager Bailey Co.; S. M. Gross, assistant general manager May Co.; Charles S. Howe, president Case school; Fred H. Caley, secretary Automobile Club; C. E. Adams, president Cleveland Hardware Co.; W. G. Marshall, president-treasurer Marshall Drug Co.; E. R. Fancher, governor federal reserve bank; Parmley W. Herrick, the Bonbright-Herrick Co., investment house; F. W. Steffens, secretary Cleveland Typographical Union; Henry W. S. Wood, president Equity Savings & Loan Co.

### Commission Defeat Changed to Victory.

Daytona, Fla.—Notwithstanding that the election inspectors and city council had decided that the commission form proposal had been defeated by its not getting a three-fifths vote, the backers of the new charter fought a twelve-hours battle in the circuit court and won. Judge J. W. Perkins ordered City Clerk Porter to call a primary election as a preliminary to the election of the new commissioners. The vote was 253 for to 252 against.

### Fired for "Efficiency and Economy."

Boston, Mass.—Mayor Curley caused a sensation at city hall by directing the discharge of eighteen men who have been from ten to thirty-two years in the service of the city. The most important removal is that of Frank A. McInnes, division engineer in charge of the sewer and

water service, whose salary is \$5,000 a year. Others discharged are Edward C. Wade, supervisor of street lighting, thirty-two years in the employ of the city; George H. Foss, supervisor of the sanitary service; Storrs L. Durkee, supervisor of permits, and Bliss W. Robinson, superintendent of the pumping station. The others who are removed from office are chiefly subordinates, all in the public works department. The reason for each dismissal was that the position had been abolished. Indications are that a warm fight will be waged by many of those ousted, the positions being under civil service. Mayor Curley stated that he believed that the abolition of the positions would cut down expenditures in an unwieldy department. He also predicted further cuts.

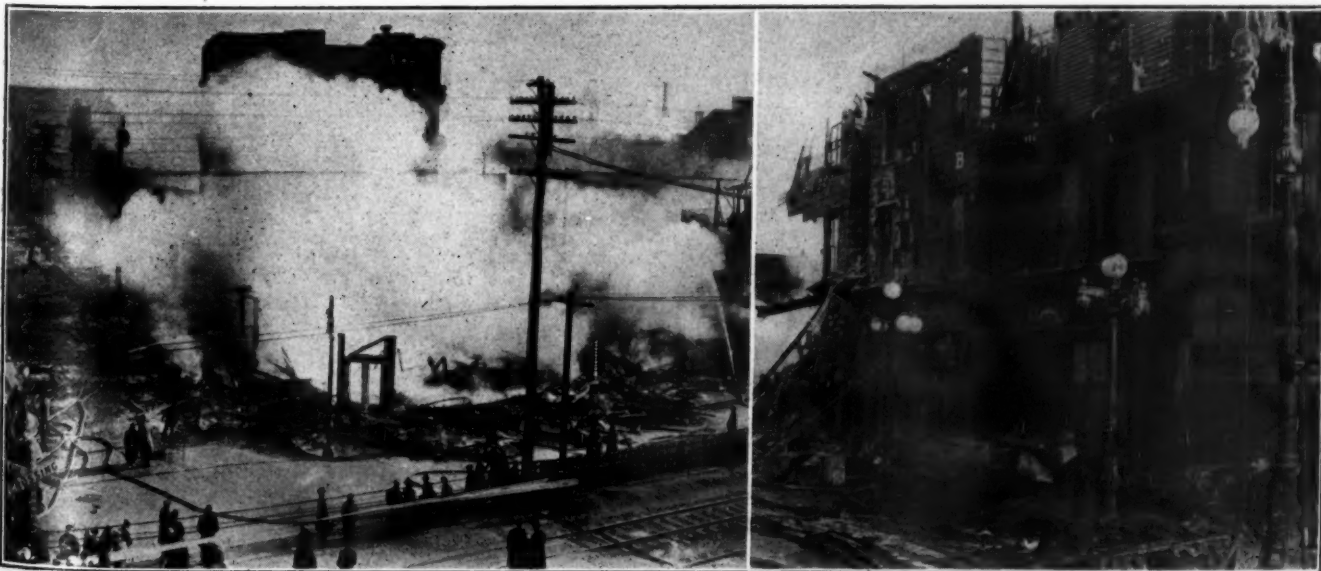
## MISCELLANEOUS

### Des Moines Smoke Ordinance.

Des Moines, Ia.—The recent decision of the United States supreme court declaring valid the Des Moines smoke ordinance has attracted widespread interest in other cities, according to Horace Susong, city clerk of Des Moines. The decision by the supreme court was on appeal by a Des Moines laundry man who has been convicted of violation of the smoke ordinance. As the result of this victory the local authorities have announced that they will take steps to enforce rigidly the provisions of the ordinance henceforth. The ordinance which was adopted by the city council on September 6, 1911, declares "the emission of dense smoke within the city of Des Moines to be a public nuisance." Under its provisions an official known as the "smoke inspector" is the sole arbiter as to the violations, and he is charged with a duty of making frequent inspections. Smoke density is limited to 3 on the Ringelmann chart, and the time limit is six minutes in any one hour. Fines of not less than \$10, or more than \$100, are imposed for each violation of the ordinance. A smoke abatement commission composed of five members acts as advisor to the inspector in the conduct of the department. No new plans for producing power and heat nor any new chimney furnace or fireplace are allowed in the city until plans and specifications have been approved by the inspector and a necessary permit issued by him. The same rule applies to alterations.

### Floods and Flood Control.

The past months have been marked by continuous heavy and damaging floods in several parts of the country, particularly in Ohio, Indiana, Illinois, Arizona and California. In the first and the last named states flood control improvements of huge magnitude are in process of construction.



Courtesy, Newark (N. J.) Evening News.

PASSAIC'S BUSINESS DISTRICT AFTER FIRE.

Hamilton, O.—Work on flood prevention reservoirs in Miami valley will be commenced next spring. The Twin creek dam, north of Middletown, will be among the first built. All surveying has been completed and the preliminary details worked out. When work is begun it will be pushed to completion. It has been estimated that two year's steady work will be consumed in completing each reservoir. There will be seven in all. Chief Engineer Morgan will have as associate Prof. Daniel W. Mead, of Madison, Wis. The conservancy district has opened a new building, from which will be directed the work on the \$20,000,000 project. The floods at the beginning of the month affected the Sandusky, Blanchard and Scioto rivers, and the towns on their banks. At Tremont residents were driven out of their homes; factories were closed; the false work and steel for the new bridge was washed away. Parts of Findlay were cut off from the city by the flooded Blanchard, which stopped communication and inundated homes. At Tiffin more than \$100,000 damage was caused by the floods. Sandusky and Lima also suffered.

Evansville, Ind.—During the week after the Ohio floods heavy and continuous rains in the "pocket" of Indiana caused alarming flood conditions, especially in the lower Wabash region. The Ohio here rose beyond six feet above flood stage. The most serious situation was along the Wabash river from Vincennes, down to the mouth of the river, and from Decker on White river to Hell's Neck on the Wabash. From Decker it was reported that the Dixie Bee Line highway north of Hazleton was flooded and badly washed in places. Night and day patrols watched the bridges.

Los Angeles, Cal.—While an issue of \$3,600,000 bonds for beginning work on flood control plans was being discussed by the members of the Los Angeles County Flood Control Association, the floods reached the city and made arguments very concrete. While the city suffered only about \$10,000 damages, the surrounding country lost millions of dollars worth of property. Frank H. Olmsted, of the board of flood control engineers, declared that the check dams built in some of the nearby districts during the last two months proved very effective in controlling the flood.

Pomona, Cal.—The heavy rainfall and floods did great damage to the city and surrounding country. New paving was washed out and bridges undermined. At Redlands one thousand feet of new county highway was washed out. Monrovia, Colton and Santa Monica also suffered. A movement has already started to form a protection district to control the flood waters of San Antonio river from the canyon to the beginning of the Chino district. With breaks in the Santa Ana river the whole valley was inundated. While negotiations were on for the right of way for a 200-foot channel from the river to the Pacific, the river broke the banks and burst the channel itself, relieving the serious situation. Engineers of the Newbert Protection district had estimated the cost of the cut to be \$25,000.

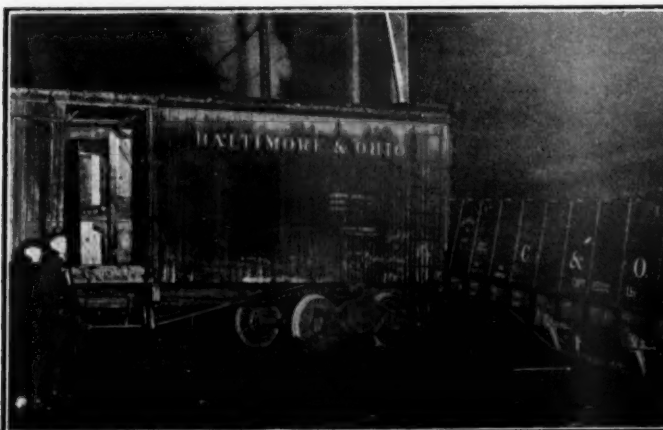
San Diego, Cal.—Heavy rainfalls and swollen rivers flooded the city and isolated it for two days. Many families were rendered homeless. The Otay water supply reservoirs were threatened for a number of days until finally the dam gave way and disaster swept the valley, killing many. Thirty bridges and culverts and miles of road were washed out, causing the board of supervisors and county surveyor's office \$300,000 loss. While this devastation was in progress the committee on flood control and reclamation submitted a partial report to the State Water Problems Conference at San Francisco on work in the San Joaquin Valley.

Yuma, Ariz.—Flood conditions assumed dangerous proportions and the Gila and Colorado rivers did hundreds of thousands of dollars' worth of havoc before they receded to normal levels. For a time the bridges of Phoenix were in danger and constant watch was kept. At Winkelman the Gila left its banks and cut a new channel.

Chicago, Ill.—Property loss estimated at millions, thousands of men, women and children driven from their homes, pollution of the water supply of Chicago and suburbs, flooded basements, marooned families, and appeals for aid from territory within a radius of fifty miles from Chicago followed the disastrous flood that swept northern Illinois without warning. A steady rain of sixteen hours' duration falling on the ice-glazed surface of the earth, and snow-choked sewers and ice-blocked streams was the immediate cause of the record-breaking torrent. While Chicago's loss will run to an estimated figure of \$1,000,000 or more, the greatest suffering is reported from Joliet, Aurora and other cities and villages along the Fox and Des Plaines rivers. At Joliet 2,000 persons were driven from their homes and forced to quarters in hospitals and other relief places. Bridges gave way. Mayor and council called special meetings for relief. Damage amounted to \$500,000. Desperate efforts were made at Mooseheart to keep an artificial lake from pouring over a dam. Aurora, Rockford, Ottawa, La Salle, Oak Park and Maywood also suffered. At Berwyn a pumping station was flooded and the water supply stopped. At Streator the factories were shut down and only superhuman efforts restored the city's water supply, which had been cut off. The lights were out because of the power plant being put out of commission. Total loss in the valleys is estimated at \$3,000,000. Receding floods found the health authorities of the cities busy getting ready to fight possible epidemics.

#### Grade Crossing Crash.

Springfield, O.—The accompanying illustrations show the effect of a freight train colliding with a street car at a grade crossing. Three were killed and thirty-one badly injured, three probably fatally. The rapidly moving train struck the packed car squarely in the center, hurling the top of it 40 feet down the tracks. Two of the freight cars were derailed. The conductor had gotten off when the car reached the tracks to look out but had not noticed a train backing towards his car.



Courtesy, Springfield (O.) Daily Sun.

THE MENACE OF THE GRADE CROSSING.

**Municipal Market for Flint.**

Flint, Mich.—The Flint common council has directed Alderman Gordon and the city engineer to buy property for a municipal market. They are authorized to spend \$40,000. This action follows agitation extending over several months and was directly brought out by the presentation of two petitions—one by J. F. Rieman, president of the Genesee County Farmers' Institute, and signed by 600 farmers, and the other by Supervisor Minto, of this city, and signed by many Flint business men, all asking the establishment of the municipal market. A comfort station in connection with the market is proposed.

**Plan Commission Appointed.**

Hazleton, Pa.—A planning commission for the city of Hazleton has been appointed by the council. From a list of names which had been suggested by the municipal affairs committee of the Chamber of Commerce, a majority of the new commissioners were selected. The new commissioners are: J. E. Altmiller, civil engineer and superintendent for the Union Improvement Co., 5 years; Charles Kehoe, contractor, 4 years; Emil Buehler, superintendent of the Duplan silk mills, 3 years; B. E. Youngman, city engineer, 2 years; Lewis Kepping, chief of the fire department and city assessor, 1 year.

**Mayor a "Movie" Star.**

Alton, Ill.—Alton is to be pictured as a model city for moral conditions in the new play which the Essanay Company is producing and Mayor Edmond Beall of Alton will play one of the leading parts in the pictures. Mayor Beall has signed a contract whereby he is to receive \$100 per day and expenses for his services in the movies. The pictures will "film" the report of the Illinois Vice Commission. Mayor Beall is 67 years of age.

**Proposed New Building Law.**

Boston, Mass.—A far-reaching bill, establishing new housing laws for Massachusetts, has been submitted in the house by Representative Chamberlain of Springfield. The measure, which contains 121 sections, would take effect in any town accepting it at a town meeting and in any city upon its acceptance at any city or special election. The measure applies to all dwellings now existing or hereafter erected. Each dwelling hereafter erected on a corner lot with streets on three sides shall occupy not more than 90 per cent of the area; other corner lots, 85 per cent; and interior lots, from 55 to 70 per cent. No new dwelling shall exceed in height the width of the widest street on which it stands, unless it be set back a distance equal to the excess of its height. In every dwelling four stories or less in height every inner court shall have one or more horizontal air intakes at the bottom; over four stories two or more such intakes. Every room shall have at least one window opening on the street, yard or court. Every new multiple dwelling of more than two stories shall have one or more fire escapes. For buildings of two and one-half stories for more than two families and of second-class construction the stairs and halls shall be constructed of incombustible material throughout, except that the treads may be of hard wood not less than two inches thick. All stairs and halls shall be enclosed on all sides by brick or other approved fireproof material not less than eight inches thick. No wooden multiple dwelling shall be erected hereafter and no wooden building not now used as a multiple dwelling shall be altered or converted into a multiple dwelling. Whenever a house is not provided with sufficient means of egress in case of fire the building inspector shall order additional means. No horse, cow, sheep, goat, chickens, geese or ducks shall be kept on the same lot or premises with a new multiple dwelling. If any room of a house is overcrowded the board of health may order the number of persons living in a room to be reduced so there shall be not less than four hundred cubic feet of air to each adult and three hundred cubic feet for each child under twelve years. The board may prohibit the letting of lodgings in multiple dwellings by any of the tenants occupying the house.

**LEGAL NEWS****A Summary and Notes of Recent Decisions—  
Rulings of Interest to Municipalities****Jitney Licenses—Reasonableness of Amount.**

Ex Parte Counts.—A city ordinance licensing jitney buses and regulating the tax according to the seating capacity, was not invalid as failing to comply with the charter provision that all licenses should be graduated according to the amount of business done.—Supreme Court of Nevada, 153 P. R., 93.

**Highways—Duties of Towns—Damages.**

Fifield's Adm's v. Town of Rochester.—Where there was a defect in the approaches to a culvert and it had existed for so long a time that the town knew or ought to have known of and remedied it, the town is liable for any injuries to travelers in the exercise of due care, proximately caused thereby, and recovery cannot be limited to defects in the culvert itself.—Supreme Court of Vermont, Windsor, 95 A. R., 675.

**Sale of Bonds—Repudiation of Contract—Compensatory Damages.**

Junction City v. Central National Bank of Junction City.—Where a city offers its paving bonds for sale, and the successful and accepted bidder repudiates its contract of purchase, the city may recover from such bidder compensatory damages, even if these exceed the sum which the bidder puts up as a pledge of good faith accompanying the bid.—Supreme Court of Kansas, 153 P. R., 28.

**Reassessments—Proceeds—Mandamus.**

City of Chehalis v. Robinson et al.—In mandamus proceedings brought by a street improvement contractor to compel the city to make a reassessment, wherein certain property owners intervened, alleging that the contractor had been overpaid, and that the property of the assessment district had not been benefited in excess of a sum less than that which had been paid to him, a judgment dismissing the proceedings was not conclusive as to the amount which the contractor was entitled to recover, where it appeared that under the statute then controlling no reassessment could be made, and that hence the same judgment must necessarily have been rendered had the contentions of interveners been determined against them.—Supreme Court of Washington, 152 P. R., 697.

**Tenement House Regulation—Violations—Recovery of Penalties.**

Tenement House Department of City of New York v. Meyerson.—In an action to recover a penalty for fire escape violations, where a violation was proved without contradiction, it was error to direct judgment for defendant on the ground that it would be harsh and beyond the contemplation of the statute to impose the penalty, because defendant had filed plans for the improvement of the building eliminating the violations, and had subsequently removed such violations, as the court cannot suspend statutory penalties because in an individual case it may seem unfair and inequitable to enforce the law.—Supreme Court, Appellate Term, First Department, 155 N. Y. S., 352.

**Streets—Operation of Automobiles—Power to Regulate Jitneys.**

Ex Parte Bogle.—Under Austin city charter (Sp. Acts 31st Leg. c. 2), providing that the mayor and councilmen shall have all the legislative, executive and judicial powers granted, that the council may adopt ordinances not inconsistent with the Constitution and statutes, and shall have exclusive control over streets, and power to regulate the use of same, and to regulate the speed and handling of automobiles, the city could enact and enforce such reasonable ordinances as it deemed necessary and proper to regulate the handling of automobiles including jitneys, and the use of streets by a person owning and operating the same in the carriage of passengers for hire.—Court of Criminal Appeals of Texas, 179 S. W. R., 1193.

**Width of Sidewalks—Time of Bids—Discretion of Engineer.**

City of California v. Kiesling.—Where the plans and specifications for a sidewalk were prepared and filed before publication of bids which referred to them, assessments for the work could not be defeated on the ground that the width of the walk was left to the discretion of the city engineer.—Kansas City Court of Appeals, Missouri, 180 S. W. R., 559.

**Powers of City—Implication.**

San Francisco-Oakland Terminal Rys. v. City of Alameda et al.—While the state may authorize a municipality to bind itself and establish by inviolable contract rates to be charged by a public service corporation, such power must clearly and unmistakably appear, and all doubts will be resolved against such contract.—District Court, N. D., California, S. D., 226 F. R., 889.

**Power to Make or Modify Contracts.**

Atlantic City v. Warren Bros. Co. et al.—A municipal corporation having the power to make a contract may deal with the contract in the same manner as if it were a natural person, and may, in the absence of statutory limitation, modify or cancel it in the same manner as it might originally contract; and in general its power to modify a public improvement contract is vested in the same officer or body authorized to make the contract.—Circuit Court of Appeals, Third Circuit, 226 F. R., 372.

**Maintenance of Ditch—Negligence—Liability of Municipality.**

City of Montgomery v. Stephens.—Where it was averred that a municipality was guilty of negligence in constructing and maintaining a drainage ditch, proof that some officer, agent, or employee was negligent while acting in the line of his duty is essential to charge the municipality, under Code 1907, § 1273, declaring that in no other case shall a municipal corporation be liable for the negligence of its agents.—Court of Appeals of Alabama, 69 S. R., 970.

**Breach of Contract—Dumping Rubbish.**

Dailey et al v. City of New York et al.—Where plaintiffs had contracted in 1908 for the disposal of city street rubbish, which contract permitted sea dumping only at the direction of the commissioner of street cleaning, and the contract which plaintiffs made with the city in 1913 for the same work provided that it should at all times be subject to the commissioner's supervision, inspection, and approval, that his interpretation of the contract should be final in case of doubt, ambiguity, or obscurity as to its meaning, and that he might give all directions and explanations required to make the provisions of the contract clear and effective, making no mention of sea dumping, such contract of 1913 authorized plaintiffs to dump at sea at will, and the commissioner's action in attempting to prevent them from so doing, by notification order not to do so, was unsanctioned by the contract.—Supreme Court, Appellate Division, First Department, 156 N. Y. S., 124.

**"Franchise"—Grant by City—Validity.**

City of Princeton et al. v. Princeton Electric Light and Power Co.—A "franchise" is a special privilege bestowed by the government on an individual, and which does not apply to the citizens generally as a matter of right; and where there is any ambiguity, in an ordinance granting a franchise, as to the time in which it is to be enjoyed, it will be construed more strictly against the grantee. An ordinance of a city granting to an electric light and power company the exclusive right for a term of years to manufacture and sell electric light and power within the limits of the city, with the privilege of using the streets and alleys for poles and wires, attempts to create a franchise beyond the power of the city to grant, for the right to produce and sell electricity as a commercial product is a business which is open to all, and the franchise which a city can grant is the use of its streets for the delivery of light and power produced by electricity to the consumers thereof, but it cannot grant the privilege to one to use its streets and alleys to the exclusion of another to whom it may grant a franchise for the same purpose.—Court of Appeals of Kentucky, 179 S. W. R., 1074.

**Repair of Streets—Liability of Contractor.**

O'Connell v. Merchants' & Police Dist. Telegraph Co.—One contracting with a municipal corporation to keep its streets in repair takes on himself the municipality's duty toward the public, and, if it would be liable for its negligence in such case the contractor, whose negligence caused an injury, is liable.—Court of Appeals of Kentucky, 180 S. W. R., 845.

**Payment of Taxes—Duty to Accept—Penalties.**

People v. Chicago, L. S. and E. Ry. Co.—Where a taxpayer admits the legality of some items, but contests others, the treasurer must receive taxes offered, for, if the collector were allowed to refuse anything but the entire payment, the taxpayer would become liable for penalties on the taxes due and admitted, although the taxpayer has no means of contesting the validity of other items until the county collector moves for judgment; hence, where the collector declined to receive payment of admitted items, the penalty cannot be collected thereon, but only on the contested items, which were sustained.—Supreme Court of Illinois, 110 N. E. R., 720.

**Liability of Municipal Contractor—Negligence Independent of Contract.**

O'Connell v. Merchants' & Police Dist. Telegraph Co.—A merchants' and police district telegraph company, a private corporation engaged in operating wagons to carry persons to and from the jail or hospital, or to remove injured or sick from streets and buildings to their homes, etc., under contract with a city, which, through gross and wanton carelessness and negligence on the part of its servants, ran its team over plaintiff while on the street, inflicting personal injury was liable in damages; the reason for exempting a municipality from damages for injuries inflicted in performance of its governmental functions not applying.—Court of Appeals of Kentucky, 180 S. W. R., 845.

**Slides—Filing of Claims—Damages.**

Marks v. City of Seattle et al.—Where a city, by lowering the grade of a street, removed lateral support, causing a progressive slide, which finally invaded the real estate of plaintiff, who within 30 days after the invasion filed with the city a claim for damages, plaintiff could recover for the whole damage caused by the slide, regardless of the fact that prior to the actual invasion of his property by the slide the approaching slide was a depreciating menace, and the difference between the value of his property immediately prior to the first invasion thereof and the value of the property at the time of the trial, on the theory that the depreciation had occurred more than 30 days before the filing of his claim, was not the true measure of damages.—Supreme Court of Washington, 152 P. R., 706.

**Use of Streets—Condition of Grant—Rights of Individual.**

Le Blanc et al. v. City of New Orleans.—The streets of the cities and towns in Louisiana being among the things that are "public" and "for the common use," no individual can have a property right in such use for the purposes of his private business, unless (generally speaking), that business being in the nature of a public service, utility, or convenience, such as would authorize the grant, the right has been granted by the state, which alone has the power to make or authorize it, or by the particular city or town to which that power has been delegated, and in such case the power can be exercised only in accordance with the conditions of the grant; that is to say, an individual, seeking, but not possessing, a grant of that kind, may accept the grant, with the conditions imposed by the offer, in which case he becomes bound by the conditions, or he may refuse to accept the conditions, in which case there is no grant; but without the grant so offered, or some other grant, he can never acquire the right to make the street his place of business and its use the main instrumentality in the conduct of that business. Whether, under any circumstances, an individual can compel a municipal corporation to make a grant of such right, with conditions satisfactory to himself, and unsatisfactory to the corporation, is a question that is not involved in this inquiry.—Supreme Court of Louisiana, 75 S. R., 212.

**Claims for Injuries—Impossible Location—Sufficiency.**

*Waters v. City of Tacoma.*—Where a city charter required all claims for personal injuries occasioned by defects in the streets or highways to be presented in writing within 30 days after injury, and to state the time, place, cause and nature of the injuries, a claim which stated an impossible place, setting up that the injury occurred on a street which was not in existence, is insufficient, even though the city council might have known what was intended.—Supreme Court of Washington, 153 P. R., 311.

**Civil Service—Wrongful Dismissal—Salary.**

*State ex rel. Roe v. City of Seattle.*—Where a fireman in the garbage department of a city was wrongfully dismissed, and his duties were discharged by another, he may recover from the city the amount of his salary during the period in which he offered himself for work; his duties in such cases having been indiscriminately performed by other laborers to whom he need not look for compensation.—Supreme Court of Washington, 153 P. R., 336.

**Street Grades—Resolution—Legislative Character.**

*Chase v. Kalber, Town Clerk.*—Where the trustees of a township pass and adopt a resolution establishing the grades of streets and avenues in the town, although the acts evidenced by the resolution are not put in the form of an ordinance, they are nevertheless, of a legislative character, conceding that the hearings accorded by the street law to property owners and the determinations therein are more judicial than legislative in character.—District Court of Appeals, Third District, California, 153 P. R., 397.

**Injury From Defective Sidewalk—Care Required.**

*Rose v. City of Fort Dodge.*—In an action against a city for injuries through slipping on an icy sidewalk, where the instruction as a whole advised the jury that ordinary care would not require the city to protect pedestrians against the dangers of snow and ice resulting from mere climatic conditions, the specific charge that "the defendant, at the time of the accident complained of, was required by law to use ordinary care to keep the streets and sidewalk at the place in question a reasonably safe condition for public travel," was not improper as holding the city responsible for the unsafe condition of the sidewalk, even if caused by recent climatic conditions.—Supreme Court of Iowa, 155 N. W. R., 170.

**Paving Streets—Contracts—Damages for Delays.**

*Burke et al. v. Board of Improvement Paving District No. 5 et al.*—Where a paving district and parties contracting to pave the streets of the district recognized that the paving could not possibly be completed within the time provided in the contract because of the time required for the construction by the contractors of a plant for the manufacture of bricks and the time lost on account of the failure of abutting property owners to construct the curb and guttering against which the pavement must rest, for which failure neither the paving district nor the contractors were to blame, a finding that the district was not entitled to any damages for the failure to complete the work within the specified time was warranted.—Supreme Court of Arkansas, 179 S. W. R., 654.

**Operation of Power Plant—Utilization of Waste Steam.**

*Milligan v. Miles City et al.*—Rev. Codes, §3259, authorizes a city council to build all necessary buildings for the city and to heat and light them and to provide for lighting the streets and alleys. A municipality erected an electric light and power plant, producing current to light the city buildings, streets, and alleys, and to furnish light and power to its inhabitants. Held that, as the city was authorized to conduct a power plant, it could lay a main to heat a city building by the waste steam from the plant, and incidentally furnish steam for heat to private buildings abutting on the main, since its authorization to conduct a power plant impliedly authorized it to do so in the usual manner in which such a business is conducted by private persons or corporations, which involves a due utilization of by-product.—Supreme Court of Montana, 153 P. R., 276.

**Street Sprinkling Ordinances—Validity.**

*Pacific Gas and Electric Co. v. Police Court of City of Sacramento et al.*—Where a municipality by ordinance required that a street railroad operated therein should sprinkle its tracks to lay the dust, all presumptions were in favor of the validity of such ordinance, so that the burden was on the railroad questioning it to show its invalidity; in the absence of showing to the contrary, the court was required to assume that it was a necessary police measure, and that the injury it was intended to obviate was caused entirely by the railroad.—District Court of Appeal, Third District, California, 152 P. R., 928.

**Special Assessments for Public Improvements—Street Car Tracks.**

*Board of Improvement, Waterworks Improvement Dist. 22 of Texarkana v. Southwestern Gas and Electric Co.*—The assessors of an improvement district establishing a water supply system may, after giving due consideration to all of the elements which go to make up the benefits derived, make a percentage assessment on all property within the district, based on the assessed value. But street car tracks, being personal property, and the company having no easement or freehold interest in the soil, cannot be specially assessed for a public improvement.—Supreme Court of Arkansas, 180 J. W. R., 764.

**Construction Contracts—Compensation for Extra Work.**

*Douglas and Varnum v. Village of Morrisville.*—Where, under a contract with a village for the construction of a dam which provided that extra work must be covered by an order in writing and would be paid for at actual cost, plus 10 per cent., the water and light commissioners of the village waived the requirement that extra work must be ordered in writing, the provision as to extra work remained in force, except that the words "in writing" were eliminated, and it constituted an express promise to pay for extra work covered by any order from the proper source, verbal or otherwise, at actual cost, plus 10 per cent.—Supreme Court of Vermont, 95 A. R., 810.

**Amendment to Charter—Validity.**

*State ex rel. Graham v. City of Hinton et al.*—An act amending the charter of a city is not void for the following reasons: (a) Because it provides that the common council then in office shall "within ten days from the time this act takes effect, call a special election" for the purpose of electing the new officers provided for in the act, and then fixes a date for holding same, which happens to be a date prior to the time the act took effect. In such case it was the duty of the council to call the election within ten days after the act took effect, and fix a date for holding same within a reasonable time thereafter.

(b) Because no notice of the application to the Legislature for the amendment of the charter was published, as provided in section 10, c. 12, Code 1913 (sec. 316).—Supreme Court of Appeals of West Virginia, 87 S. E., 358.

**Building Regulations—Refusal of Permit—Authority and Grounds.**

*Stubbs, Inspector of Buildings, v. Scott.*—The owner of a city lot who had petitioned the city's inspector of buildings for a permit to erect a number of stores for general business purposes in accordance with the provisions of a plan and specifications therewith filed, could not be denied the right to improve his land on the grounds stated by the inspector that the proposed building would not conform to the character of buildings in that immediate neighborhood, or the right to sell automobiles therein, where it complied with regulations as to protection against fire, etc., since, without other authority preventing its erection, the mere fact that protesting owners showed that there were no stores in that neighborhood, that it was a residence district, and that its erection might depreciate values, or the mere fact that the inspector discredited the petitioner's good faith and suspected that he intended to use it for a garage, in violation of an ordinance, was not sufficient to justify his refusal of the permit.—Court of Appeals of Maryland, 95 A. R., 1060.

## THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The Index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

### ROADS AND PAVEMENTS.

#### Highways and Roads.

Arterial Roads in Greater London. By W. R. Davidge. 2,000 words. The Surveyor, December 17. 40 cts.

Multonoman County Highways. General description of work. By Herbert Nunn, County Highway Engineer. 1 ill., 1,250 words. Pacific Builder and Engineer, November 27. 15 cts.

Multonoman County Roads in the State of Oregon. High class road construction on scenic highway along Columbia river. 1 ill., 400 words. Engineering News, January 13. 15 cts.

Columbia River Highway in Oregon. History of the highway; difficulties of construction. 13 ill., 2,000 words. Good Roads, January 1. 10 cts.

The Columbia River Highway. General description of road, location and method of construction. By Geo. D. Steele. 4 ill., 3,000 words. Better Roads and Streets, December. 15 cts.

#### State.

How a California Contractor Handles His State Highway Work. By D. G. Bevis. 2,500 words. The Contractor, January 15. 20 cts.

What Idaho Has Been Doing in Highway Construction. Discusses work done by the state since the creation of the State Highway Commission three years ago. 8 ill., 2,000 words. By Geo. D. Steele. Better Roads and Streets, December. 15 cts.

Work of the Pennsylvania State Highway Department in 1915. By Robert J. Cunningham, Commissioner. 3,000 words. Better Roads and Streets, January. 15 cts.

#### Construction.

Model Road Building Plant of a Kentucky County. Concrete storage, mixing and delivery and other details. 3 ill., 400 words. Engineering News, January 14. 15 cts.

Proper Road Location—Its Importance and Effects. By W. R. Roy, State Highway Commissioner, Washington. 2,500 words. Southern Good Roads, December. 10 cts.

Philippine Road Building. Notes of work done under American engineers. 7 ill., 600 words. Engineering News, January 20. 15 cts.

How Construction Is Progressing on the National Pike. By George D. Steele. 6,000 words. Better Roads and Streets, December. 15 cts.

Practical Street Construction. A series of articles telling how to plan and lay out the alignment, grade and cross-section; side-hill location; grades at intersections; location of sewers, water mains, etc. First article: What Streets Are Used For; Uses Besides Traffic. 11 ill., 3,000 words. Municipal Journal, January 6. 10 cts. Second article: Planning Street Alignment; Economy in Street Planning; Areas Occupied by Streets; Street Lengths. 7 ill., 1,500 words. Municipal Journal, January 13. 10 cts. Third article: Diagonal Thorofares; District of Columbia Rule for Planning City Extensions; Advantages of Diagonals. 10 ill., 1,500 words. Municipal Journal, January 20. 10 cts. Fourth article: Diagonal Thorofares; Oblique Junctions and Traffic; Single and Double Junctions; Multiple Traffic Centers; Duplicating Thorofares. 11 ill., 2,000 words. Municipal Journal, January 27. 10 cts.

Economic Highway Construction; an Analysis of Roadway Sections. Gives economic analyses of roadway sections in relation to width of roads with discussion of swamp road building. By F. W. Harris. 4 ill., 2,000 words. Engineering and Contracting, January 12. 10 cts.

Tearing Up Old Pavements and Building Road Embankments. The second of a series of articles on street and road grading, bringing out many practical features of this kind of construction. 3,500 words. The Contractor, December 1. 20 cts.

Contractors Laying Varied Types of Pavement in Joliet, Ill. Brick on concrete base, asphalt on old macadam and bituminous macadam streets are under construction. 8 ill., 2,500 words. The Contractor, December 1. 20 cts.

How to Back Fill Trenches in Connection with Street Paving. The third of a series of articles on street and road grading, dealing with both the engineering and practical features of pavements. 2,000 words. The Contractor, January 1. 20 cts.

First Paving Mixer to Work in Chicago's Congested Loop District. Details of construction where clearance was scant and traffic heavy. By Stanley E. Bates. 3 ill., 6,000 words. Better Roads and Streets, January. 15 cts.

#### Convict Labor.

Methods and Costs of Road Work in Arizona With the Honor Convict System. By F. G. Twitchell, Division Engineer. 4,000 words. Better Roads and Streets, December. 15 cts.

#### Maintenance.

Lake County, Indiana, Has Over Five Hundred Miles of Broad Macadam Highway Kept in Excellent Repair. Methods of maintenance. By Stanley E. Bates. 9 ill., 1,500 words. Better Roads and Streets, December. 15 cts.

Maintenance. Discusses care of top soil, gravel, macadam, bituminous macadam, bituminous concrete, concrete, brick, stone and asphalt roads; oiling roads. 4 ill., 5,000 words. Southern Good Roads, January. 10 cts.

Resurfacing Old Macadam Roads. Type of new surface; preparing the foundation; water bound and bituminous macadam; selection of materials. From a paper by W. D. Uhler. 2,300 words. Municipal Journal, January 13. 10 cts.

Resurfacing Old Macadam With Vitri-fied Hillside Block. Interesting type of construction for heavily traveled road. 3 ill., 1,000 words. The Contractor, January 1. 20 cts.

#### Asphalt.

Records Smashed in Asphalt Pavement Construction. Several of the contractor's time and labor saving methods described in detail. Make-up of gangs. By Stanley E. Bates. 10 ill., 3,500 words. Better Roads and Streets, February. 15 cts.

Lay-Out and Operation of a Contractor's 2,000-Yard Capacity Asphalt Plant. 3 ill., 1,000 words. Better Roads and Streets, December. 15 cts.

#### Bituminous.

Use of Tar Upon Highways. Circular sent to county and city authorities by engineer of the Road Board. 1,000 words. The Surveyor, November 26. 40 cts.

Some New Departures in Asphaltic Concrete Construction Tried Out in Oak Park, Ill. By Lester Kirschbraun. 3 ill., 1,500 words. Better Roads and Streets, February. 15 cts.

#### Brick.

Recent Advancement in the Construction of Brick Pavements. By William C. Perkins, Engineer, Dunn Wire-Cut Lug Brick Company. 2,500 words. Better Roads and Streets, February. 15 cts.

Recent Advancement in the Construction of Brick Pavements. Discusses progress with reference to sub-grade, cushion course, cushionless construction and brick surface. By William C. Perkins, Engineer, Dunn Wire-Cut Lug Brick Co. 3,000 words. Engineering and Contracting, January 26. 10 cts.

Monolithic Brick Paving Slabs Show High Bond. Tests begun at University of Illinois to determine feasibility of reducing concrete base thickness. By C. C. Wiley. 1 ill., 1,000 words. Engineering Record, January 15. 10 cts.

Vitri-fied Brick Pavements. The fourth of a series of articles on factors in the success or failure of street pavements. By Will P. Blair. 1 ill., 3,000 words. The American City, December. 35 cts.

Some Radical Changes in Brick Pavement Construction. A thin concrete

foundation for brick pavement is advocated. By P. C. McArdle. 2 ill., 1,800 words. Engineering News, January 27. 15 cts.

Building a Monolithic Brick Road Near Monticello, Ill. A newly developed type of road is being built with efficient equipment and interesting methods. By Charles P. Stivers. 6 ill., 1,800 words. The Contractor, December 15. 20 cts.

A Dual Type of Brick Paving Aids Traffic on Grades. By using two types of brick, traffic is separated, wear distributed and horses provided with a secure footing. 3 ill., 1,500 words. Engineering Record, January 8. 10 cts.

A Study of Cushions for Pavements of the Block Type. Discusses the thickness of cushion and the characteristics of sand suitable for pavement cushions. By M. B. Greenough. 4,000 words. Engineering and Contracting, January 19. 10 cts.

#### Concrete.

Concrete Pavement. The fifth of a series of articles on factors in the success or failure of street paving. 5 ill., 4,500 words. American City, January. 35 cts.

Proportioning Concrete for Road Work; Suggestions for Improvements. Discusses principles of correct proportioning and of scientific methods of road building generally. By W. W. Crosby. 3,500 words. Engineering and Contracting, January 12. 10 cts.

#### Macadam.

Macadam Road Construction in Michigan. Construction methods; equipment used. By G. C. Dillman, District Engineer, State Highway Department. 7 ill., 1,000 words. Better Roads and Streets, February. 15 cts.

#### Wood Block.

Durability of Creosoted Wood Blocks Increased by Modern Methods of Treatment. By Frank W. Cherrington. 2 ill., 3,500 words. Municipal Engineering, December. 25 cts.

#### Miscellaneous.

Elevation of Low Level Street on Pittsburgh River Front. A new step in raising the city above flood level. A new street drainage system devised. By C. M. Reppert. 4 ill., 2,000 words. Engineering News, January 27. 15 cts.

Reducing Hillside Street Grade from 29 to 16 Per Cent. Solution of an unusual street problem in hilly residence district in San Francisco. 1 ill., 600 words. Engineering News, January 6. 15 cts.

Repairing Pavement Cuts in Ottawa. Method of repairing with reinforcement. 1 ill., 500 words. Municipal Journal, January 6. 10 cts.

Abutting Paving. Gives the per cent paid by the city and by property owners in the larger cities. By R. K. Compton. 7,000 words. Journal of Engineers' Club of Baltimore, December. 10 cts.

The Value of Preparation for Street Improvements. Financing, preliminary investigation as to width, traffic, etc. and administration. By Arthur H. Blanchard. 2,500 words. The American City, January. 35 cts.

Pitch Fillers for Block Pavements. In view of the recent adoption by a number of cities of the grout filler, this discussion of the subject is very interesting. By John Crandell. 1 ill., 1,000 words. The Canadian Engineer, January 20. 15 cts.

Sanding icy Sidewalks. By Chester W. Shafer. 1 ill., 500 words. Municipal Journal, January 27. 10 cts.

Papers Presented at the Worcester Road Congress. The Development of Highways in Canada and What It Means to the Dominion, by W. A. McLean; The Selection of Types for Road Surfaces, by W. W. Crosby; Improved Granite Pavements, by Henry W. Durham; Organization of Highway Department and the Use of Planning Board to Simplify the Operation, by William H. Connell. 6 pages. Good Roads, January 1. 10 cts.

## SEWERAGE AND SANITATION.

## Treatment.

Eight Years of Imhoff Tank Design and Operation. A review of eight years' experience in the design and operation of Imhoff two-story sewage settling tanks Germany and America. By Karl Imhoff. 13 ills., 4,500 words. Engineering News, January 6. 4,500 words. Engineering News, January 13. 15 cts.

Disposal of Sewage by Dilution; A Biochemical Method of Purification. By W. E. Addeney. 7,000 words. The Surveyor, December 10. 40 cts.

Recent Improvements in the Construction of Cultivation Tanks. By W. D. Scott Moncrieff. 1,500 words. The Surveyor, December 10. 40 cts.

Kimberley City Sanitary System. Describes methods in use in Kimberley, South Africa. By James Dunn. 3,500 words. December 24. The Surveyor. 40 cts.

Main Garrison Creek Storm Overflow Sewer and Extensions. Review of its construction with particular reference to Section 4 recently completed. Some data on labor and material costs on Toronto work. By R. T. G. Jack. 10 ills., 4,500 words. Canadian Engineer, January 27. 15 cts.

Design and Construction of Tanks for Temporary Storage of Storm Water at Toronto, Canada. Explains object and operation of tank. By W. G. Cameron. 1 1/2 ills., 2,500 words. Engineering and Contracting, January 26. 10 cts.

Tanks for Temporary Storage of Storm Water. Design and methods of construction of stand-by tanks in Toronto. Detritus, etc., is allowed to settle and only dilute surface water passes directly into Lake Ontario while all the dry flow is carried to the disposal works. By W. G. Cameron. 7 ills., 1,500 words. The Canadian Engineer, January 6. 15 cts.

Sewers. Privately Financed Sewer System for Small Town Produces \$2,000 Yearly Revenue. Citizens of Troy, Pa., secure public improvement without exceeding limit of bonded indebtedness. Tannery wastes cause trouble. By Henry W. Taylor. 2,000 words. Engineering Record, January 8. 10 cts.

Sewerage System at the General Electric Company's Works, Schenectady, N. Y. An interesting feature of the article is the reference to the willingness of a large manufacturing company to co-operate with the city when the sewerage system was under revision. A large part of the article is devoted to the description of the pumping station which is electrically driven and to the simple method of disposing of the screenings. By Paul G. Koch. 4 ills., 1,200 words. General Electric Review, February. 20 cts.

Rideau River Intercepting Sewer. In designing this interceptor, a route and grade were adopted which permit of its incorporation in a main drainage scheme for Ottawa. By McLaren Hunter. 2 ills., 1,000 words. The Canadian Engineer, January 13. 15 cts.

Design and Construction of an Intercepting Drain to Protect the Surface Water Supply of Fall River, Mass. Describes local conditions calling for this construction and describes and illustrates details of design and construction. By H. K. Barrows. 9 ills., 3,500 words. Engineering and Contracting, January 19. 10 cts.

Building a Six Foot Segmental Sewer. Describes how a city solved its sanitation problem by using hollow clay block. By Benjamin Wilk. 5 ills., 2,500 words. Brick and Clay Record, January 4. 20 cts.

Method of Keeping a Graphic Cost-Progress Record on Sewer Construction. Describes and illustrates methods used by J. B. McCrary Company of Atlanta, Ga. 1 1/2 ills., 1,500 words. Engineering and Contracting, January 19. 10 cts.

Pumps. Sewage Pumps in New Orleans. New design to secure high efficiency through a wide range of lifts. Result of test. 3 ills., 2,500 words. Municipal Journal, January 6. 10 cts.

Mammoth Screw Pumps of New Design Develop High Efficiency for Low Lifts. Performance exceeds expectations at New Orleans drainage station. 6 ills., 3,000 words. Engineering Record, January 8. 10 cts.

Huge New Orleans Screw Pump Shows 80 Per Cent Efficiency. Two articles describe the recent tests of novel drainage pumps. By W. H. P. Creighton and G. G. Earl. 10 ills., 4,200 words. Engineering News, January 13. 15 cts.

Economic Desirability of Expert Operation and Maintenance of Drainage

Pumping Plant. Discusses poor and good operation. 1 1/2 ills., 1,000 words. Engineering and Contracting, January 19. 10 cts.

## Miscellaneous.

Hydraulic Ejectors for Grit Removal Merit Trial in Sewer Maintenance. Tests needed to demonstrate further possibilities of catch basin cleaning by new method adopted in city of Seattle. By John H. Gregory. 4 ills., 3,000 words. Engineering Record, January 29. 10 cts.

How a Contractor Is Putting a Stream Underground. Method and equipment used in boxing up a water course in Indianapolis. 7 ills., 1,500 words. The Contractor, January 15. 20 cts.

## WATER SUPPLY.

## Water Works.

A Discussion of 14 Important Features of Water Works Operation; Montana Regulations Governing Water Service. Discusses provisions, installation and maintenance of service pipes, ownership of meters, meter deposit, meter rental, meter maintenance, tapping charge, notice of shut-off, penalizing delinquents, refusal of service to renters, additional fixtures on flat rates, consumers supplying others, fines and extensions of mains. Gives a set of 11 rules. 6,000 words. Engineering and Contracting, January 12. 10 cts.

Recent Progress and Tendencies in Municipal Water Supply. Reviews the developments of large surface supplies and discusses the improvement of quality made possible by rapid sand filtration. From a paper by John W. Alvord. 3,200 words. The Canadian Engineer, January 6. 15 cts.

Recent Progress and Tendencies in Municipal Water Supply. Second portion of paper describing methods of water disinfection; water consumption, fire protection and rates are also considered. By John W. Alvord. 4,000 words. The Canadian Engineer, January 13. 15 cts.

Bombay Water Supply. Describes original plant and additions for increasing the capacity. 3 ills., 1,500 words. The Surveyor, January 7. 40 cts.

Water Supply of Salem, Mass. Paper before the Boston Society of Civil Engineers. By William S. Johnson, Consulting Engineer. 4 ills., 12,500 words. Journal of the Boston Society of Civil Engineers, January. 50 cents.

Two Small Waterworks. Describes system for two small towns in Ireland. By W. L. Duffin. 1,000 words. The Surveyor, January 7. 40 cts.

## Purification.

A discussion of Filter Troubles. Silt, iron removal, red water and air in filters. By F. F. Longley. 1,800 words. American City, January. 35 cts.

The Filtration Plant at Decatur, Ill. Describes sedimentation basins, filter units and coagulant devices. 4 ills., 2,000 words. Fire and Water Engineering, December 15. 10 cts.

Treatment of Water With Hypochlorite. Paper presented at meeting of Canadian section of Society of Chemical Industry. By Joseph Race. 4,000 words. The Surveyor, December 3. 40 cts.

## Pipe Lines.

Method, Cost and Result of Testing New Water Mains at Hartford, Conn. Discusses results and describes equipment used. By C. M. Saville. 1,200 words. Engineering and Contracting, January 26. 10 cts.

Tar Coat Protects High Velocity Conduits. Arrowrock dam outlets of concrete, discharging at 60 feet per second, are painted with water gas and coal tar. 1,000 words. Engineering Record, January 22. 10 cts.

Tar Coating for Concrete Pipe Under High Pressure. Results of unique practice by U. S. Reclamation Service. By C. H. Paul. 800 words. Engineering News, January 16. 15 cts.

Sanitary Features of Los Angeles Aqueduct. Drainage area remarkably free of inhabitants or other sources of pollution; storage of more than two months in Haiwee reservoir and aqueduct seems to insure removal of any pathogenic bacteria. By Burt A. Heinly. 5 ills., 1,500 words. Municipal Journal, January 13. 10 cts.

New Quincy Intake Characterized by Provision Against Accumulation of Sand. Line laid in gravelly river bed to replace old wood stave line. Was constructed in sections on skids on shore. 1 1/2 ills., 1,250 words. Engineering Record, January 1. 10 cts.

Laying a Submerged Water Main by Rope Haulage. An original method; failed when half of pipe was laid; crossing completed by usual method. By H. P. Hemstrought. 4 ills., 800 words. Engineering News, January 20. 15 cts.

## Reservoirs.

Reservoir Improvements at Castleton, N. Y. Preventing pollution of supply by intercepting stream above swampy area and excluding flood waters from the reservoir. Securing circulation in the reservoir. Itemized cost of work by day labor. By Henry W. Taylor. 4 ills., 2,250 words. Municipal Journal, January 27. 10 cts.

Reservoir and Concrete Dam in Glacial Drift. Plans for earth dam abandoned. Design and construction of hollow concrete dam. Clay used to stop seepage from reservoir. By H. J. Langlois. 4 ills., 2,500 words. Engineering News, January 20. 15 cts.

The Middleboro Reinforced Concrete Tower Tank. Describes the foundation, the tower and the tank and the method of reinforcement. By Geo. A. Sampson. 5 ills., 3,000 words. Fire and Water Engineering, January 12. 10 cts.

Old and New Water Tank at Princeton, N. J. An old style tank and trestle of outgrown capacity has been replaced by a tank and trestle of current design. The old tank has been put in use elsewhere. By R. W. Becker. 3 ills., 1,500 words. Engineering News, January 27. 15 cts.

Inclosing 2,500,000-Gallon Steel Water Tank With Masonry. A steel tank 100 feet in diameter and 44 ft. 3 in. high is inclosed with Rockport granite concrete-backed wall 114 ft. in outside diameter. The roof is of steel framework covered with reinforced concrete on its main flat portion and Imperial German tile on the hexagonal turret roof. The tank and tower are on a concrete foundation. 2 ills., 700 words. Engineering News, January 20. 15 cts.

## Pumps.

Shop and Acceptance Tests of 30,000-000 gallon Pump. Two tests of a turbine driven centrifugal pump the results of which check within 2 1/2 per cent. 3 ills., 2,000 words. Power, December 14. 5 cts.

Quebec Air-Lift Pump Raises Water 495 Feet. 1 1/2 ills., 300 words. Engineering News, January 20. 15 cts.

## Miscellaneous.

Leakage Survey of Syracuse Water Mains. A waste of nearly a million gallons a day was discovered in 20 per cent of the area of the city. 4 ills., 800 words. Municipal Journal, January 6. 10 cts.

The Saline Method of Water Flow Measurement as Used in the Acceptance Test of a Pumping Plant. This method of measurement is accurate and inexpensive. The apparatus required is simple and the operation can be performed without the aid of an expert chemist. By W. D. Peaslee. 6 ills., 5,000 words. General Electric Review, February. 20 cts.

Underground Water Dispute in California City. San Bernardino is trying to enjoin Riverside from diverting water from artesian basin. By K. Q. Volk. 600 words. Engineering News, January 6. 15 cts.

Some Hints on Drilling and Constructing Driven Wells. Also discusses shooting of water wells and a drilling of a straight bore. By John G. Kilpatrick. 2,000 words. Engineering and Contracting, January 12. 10 cts.

Sources of Water Pollution. Abstract of paper read at the convention of the Central States Section, American Waterworks Association. By John W. Hill. 2,500 words. Fire and Water Engineering, January 12. 10 cts.

Some Considerations in Estimating the Sanitary Quality of Water Supplies. From a paper and discussion before American Waterworks Association, by W. H. Frost. 12,000 words. Water and Gas Review, January. 20 cts.

Methods Employed in Grubbing the Kensico Reservoir. Describes conditions and gives data on dynamite consumption. 1,500 words. Engineering and Contracting, January 19. 10 cts.

Preparation for Spring Extension of Water Works Service. By Morris Knowles. 2,000 words. American City, January. 35 cts.

Losses in Fire Hydrants. Actual measurements of losses in various parts of hydrants in regular service. Details of design suggested by tests. By C. M. Saville. 1 1/2 ills., 1,500 words. Municipal Journal, January 13. 10 cts.

Methods of Washing Slow Sand Filters. Describes methods of washing sand and gives some notes regarding practices and costs at various plants. By John Gaub. 2 ills., 2,500 words. Canadian Engineer, January 13. 15 cts.

Engineering and Economic Features of the Irrigation System of the Los Angeles Aqueduct; Construction Just Beginning. Describes the irrigation distribution pipe line system and all irrigation work to be fed by the aqueduct. Discusses irriga-

tion requirements. By B. A. Heinly. 4 ills., 5,000 words. Engineering and Contracting, January 26. 10 cts.

Municipal Irrigation System of Prosser, Washington. City supplies water for irrigation as well as for domestic, commercial and fire purposes. Irrigation service is separate. 1 ill., 1,500 words. Municipal Engineering, December. 25 cts.

Variation in Annual Rainfall. Based on available rainfall records of the United States Weather Bureau. By Allen Hazen. 1 ill., 1,400 words. Engineering News, January 6. 15 cts.

## STREET LIGHTING AND POWER.

### Lighting.

The Fundamental Principles of Good Lighting. Discusses the sources of light, the reflecting and scattering properties of objects and the properties of the eye. By P. G. Nutting. 7,000 words. American Gas Light Journal, December 27. 10 cts.

The Replacement of Old Style Street Lamps and Lighting Fixtures. Some recent types of globes and standards. By J. R. Cravath. 14 ills., 3,000 words. The American City, January. 35 cts.

### Power Plants.

Regina Municipal Power Plant. Novel features include boiler and economizer arrangement, English turbines, condensers and other equipments, and motor driven auxiliaries. Plant is very economical in operation. By A. G. Christie. 6 ills., 5,000 words. Power, December 7. 5 cts.

Municipal Power Plant at Medicine Hat. A combined electric power and water pumping plant with natural gas fired boilers. The current generating capacity is about 3,000 k. w., which is sold at rates of from one to six cents per k. w. h., with a sliding scale of discount for quantity purchased. By A. G. Christie. 7 ills., 2,500 words. Power, February 1. 5 cts.

Good Showing of Cleveland Municipal Plant. Cost of the generating plant was \$56,869 per k. w. Production cost of current at switchboard is 0.375 ct. per k. w. h. 1,500 words. Power, December 28. 5 cts.

Municipal Lighting Plants. Figures concerning electric light plants of Massachusetts; comparison of municipal and private plants as to operation and rates. 1,500 words. Municipal Journal, January 6. 10 cts.

Experience With the Diesel Engine in the Municipal Power Plant of Palo Alto, Cal. Discusses economical selection of a prime mover and, for the Palo Alto engine, efficiency, fuel oil consumption, supplies, regulation, reliability and probable life. By J. F. Byxbee, City Engineer. 1 ill., 4,500 words. Engineering and Contracting, January 12. 10 cts.

Tacoma Hydro-Electric Power Plant. Contains four 3,000 h. p. turbines under 415 foot head. Cost \$55.14 per h. p. Total cost of plant including sub-station transmission line and general expenditure was \$2,354,984.35. By W. L. Kidston. 8 ills., 3,000 words. Power, January 4. 5 cts.

Construction and Operation of a Small Steam Plant. Conditions governing nature of generating and distribution system to furnish energy to small communities. By G. A. Collins. 3 ills., 2,000 words. Electrical World, January 29. 10 cts.

Operating Cost of Small Power Plants. Relative cost of steam, gas and oil engine operation analyzed for plants of less than 250 h. p. without heating load. By Robert Kehoe. 2,500 words. The Isolated Plant, January. 10 cts.

Developments in the Electrical Industry During 1915. By John Liston. 29 ills., 10,000 words. General Electric Review, January. 20 cts.

Present Practice in the Sale of Gas in the United Kingdom. By F. W. Goodenough. 8,000 words. American Gas Light Journal, December 6. 10 cts.

A Popular Explanation of a Rational Basis of Comparing Gas and Electric Light. By G. C. Shadwell. 3 ills., 2,500 words. American Gas Light Journal, January 31. 10 cts.

Some Difficult Work in Laying Large Gas Pipe Under the Lachine Canal and Adjacent Swamps. Description of methods employed. By C. H. Osler. 2 ills., 4,500 words. American Gas Light Journal, December 13. 10 cts.

## FIRE EQUIPMENT.

### Protection.

Des Moines Fire Department. Report of National Board of Fire Underwriters shows a low loss per fire and states that apparatus is in good condition and well

selected. 2,500 words. Fireman's Herald, December 4. 5 cts.

Nashville's Fire Department. Report of National Board of Fire Underwriters show the department was undermanned and that additional motor apparatus is needed. Average loss per fire high. 2,000 words. Fireman's Herald, January 8. 5 cts.

Fire Department Equipment in Cities of 5,000 and over in the United States and Canada. Continued from previous numbers. 3 pages. Fire and Water Engineering, December 29. 10 cts.

Fire Service at New Bedford, Mass. Report of National Board of Fire Underwriters. 3,000 words. Fire and Water Engineering, December 1. 10 cts.

Report on Fire Conditions at Green Bay, Wis. Fire Department as described in the report of the National Board of Fire Underwriters. 3,000 words. Fire and Water Engineering, December 29. 10 cts.

### Prevention.

Fire Prevention by Firemen. The Portland Fire Prevention Bureau, how it is organized and what it has accomplished. By Lieut. E. L. Sinex. 1,000 words. Fireman's Herald, January 15. 5 cts.

Fire Department Work in Fire Prevention. By J. C. McDonnell, Chief of Fire Prevention, Chicago. 2,000 words. Fire and Water Engineering, December 15. 10 cts.

Constitutionality of Law Authorizing the State Fire Marshal to Condemn and Remove Buildings That Are Fire Hazards. By D. B. Sharp. 2,500 words. Fire and Water Engineering, January 19. 10 cts.

A Plan to Make Members of Fire Departments Inspectors of Fire Hazardous Conditions. By John T. Winship, State Fire Marshal of Michigan. 2,000 words. Fire and Water Engineering, December 22. 10 cts.

### Apparatus.

Speed of Fire Apparatus. Supreme Court of Minnesota holds that fire vehicles are not subject to ordinary speed rules. Duty of fire departments to go beyond city limits. 1,500 words. Fireman's Herald, January 15. 5 cts.

Motor Experience in New York. In five years the fire department has placed 306 pieces of automobile apparatus in service. Advantages over horse-drawn equipment. By Robt. Adamson, Fire Commissioner. 1,200 words. Fireman's Herald, January 22. 5 cts.

### Miscellaneous.

Improvements in Philadelphia's Fire Alarm System. Modern street boxes substituted for old style, overhead wires placed underground and central operating room reconstructed. Motor generators replace batteries. 5 ills., 1,500 words. Municipal Journal, January 20. 10 cts.

Examination for Promotion in New York Fire Department. Lieutenants were given severe examination for promotion to captaincy. 1,800 words. Fireman's Herald, December 25. 5 cts.

Chiefs' Opinions of Two Platoon System. Comment by chiefs of several large cities. 1,000 words. Fireman's Herald, January 22. 5 cts.

Manufacture, Selection and Care of Rubber Tires for Fire Apparatus. Describes actual manufacturing process and discusses factors to be considered in the selection of tires. By A. H. Leavitt. 3,500 words. Fire and Water Engineering, December 22. 10 cts.

## TRAFFIC & TRANSPORTATION.

### Traffic.

First Traffic Census of the Central Business District of Chicago. Results of census to find out the effect of traffic on street cleaning and to ascertain the density and kind of traffic for use when a type of pavement is to be selected for any particular street. 1 ill., 3,500 words. Better Roads and Streets, January. 15 cts.

### Transportation.

Carrying a Large Volume of Passengers at a Low Operating Cost. Radical advances in new equipment in the New York Municipal Railway Corporation. Track capacity to be increased by wider cars and by improvements in rate of acceleration and retardation. 4 ills., 5,000 words. Aera, December. 25 cts.

How City People Travel. An exhaustive analysis of traffic conditions from Denver. The relative popularity of different modes of travel is brought out, and much interesting data concerning the increasing use of automobiles is given. By R. W. Toll. 7 ills., 8,000 words. General Electric Review, January 20 cts.

How the New York Barge Canal Will Be Operated. Details of power plant for lock operation. By Wm. H. Yates. 10 ills., 3,700 words. Engineering News, January 27. 15 cts.

How the New York Barge Canal Will Be Operated. Discussion of capacity and service. Description of gate machines, valve machines, capstons and concrete lock cabins. By William H. Yates. 11 ills., 4,800 words. Engineering News, January 20. 15 cts.

Modern Time-Saving Devices Increase Truck Efficiency. Describes several methods of saving time in loading motor trucks. By Jos. Husson. 2,000 words. The Commercial Vehicle, December 1. 20 cts.

Aerial Cable Way at Niagara Falls, Ont. Torres constant tension multiple cable way over whirlpool is the only one of its kind in America and the largest in the world. 12 ills., 3,500 words. Canadian Engineer, January 20. 15 cts.

## STREET CLEANING AND REFUSE DISPOSAL.

### Street Cleaning.

Street Cleaning in Cleveland. Seven per cent of the appropriation was saved. Unit costs of cleaning and refuse collection. Prices received for salable refuse. 1,200 words. Municipal Journal, January 13. 10 cts.

Street Cleaning and Paving Economy. Prevention of litter, cheap method of cleaning and character of pavement the three elements of economy in street cleaning. From a paper by Gus H. Hanna, Commissioner of Street Cleaning, Cleveland. 3,000 words. Municipal Journal, January 6. 10 cts.

Machinery in Street Cleaning. Cost and efficiency of cleaning with squeegees, flushing machines and rotary brooms. 2,700 words. Municipal Journal, January 27. 10 cts.

### Garbage and Ashes.

Garbage Incineration in Norfolk. Thirty-five tons a day burned in 9 hours. Description of plant and method of operating. Itemized costs. By William R. Russell, Superintendent of Street Cleaning. 1,500 words. Municipal Journal, January 6. 10 cts.

Experts Testify on Means of Eliminating Odors in Garbage Reduction. Spat at Springfield, Mass., evokes opinions regarding best methods of treating foul gases from digester tank. 2,500 words. Engineering Record, January 1. 10 cts.

Refuse Collection in Los Angeles. Amounts collected, force employed and cost. Frequency of collection; receptacles required and where placed. 1,200 words. Municipal Journal, January 20. 10 cts.

Ash Collection in Milwaukee. Removal from cellars and basements. Unit costs under old plan and after systematizing. Economy of truck hauling. 2,500 words. Municipal Journal, January 20. 10 cts.

### Snow.

Snow Fighting in Our Largest City. Describes methods in use in New York City, the force employed, compensation, hours of work and rules for pushing snow in sewer manholes. 6,000 words. Better Roads and Streets, February. 15 cts.

## CITY PLANNING.

Sanitary Provisions Being Inserted in Scottish Town Planning Schemes. Air space about buildings; number and character of buildings; height. By W. R. Young. 7,500 words. Journal of Municipal and County Engineers, January. 60 cts.

Bognor Housing Schemes. Description of workmen's dwellings which can be erected at a reasonable figure and let at about 5 shillings per week. By O. A. Bridges. 4 ills., 2,500 words. The Surveyor, November 26. 40 cts.

Photographic Surveying as an Aid to Town Planning. By H. E. Lance Martin. 15 ills., 4,000 words. The Institution of Municipal and County Engineers. December. 60 cts.

Mapping Canadian Cities. A discussion of the value of large scale city maps in the work of waterworks, bridge, railroad and other civil engineers and contractors. Suggestions. By D. H. Nelles. 7 ills., 2,000 words. Canadian Engineer, January 6. 15 cts.

Mapping Canadian Cities. Final portion of paper by Douglas Nelles. 1 ill., 4,500 words. Canadian Engineer, January 13. 15 cts.

## NEWS OF THE SOCIETIES

### Calendar of Meetings.

**Feb. 10-12.—MINNESOTA SURVEYORS' AND ENGINEERS' SOCIETY.** Annual meeting, St. Paul.

**Feb. 12-19.—NINTH CHICAGO CEMENT SHOW.** First Infantry Armory and Coliseum, Chicago, Ill. Secretary, Robert F. Hall, Cement Products Exhibition Co., 208 South LaSalle street.

**Feb. 15-18.—SECOND NATIONAL CONFERENCE ON CONCRETE ROAD BUILDING.**—Secretary, J. P. Beck, 208 S. LaSalle St., Chicago, Ill.

**Feb. 17, 18.—AMERICAN CONCRETE PIPE ASSOCIATION.** Annual convention, Chicago, Ill.

**Feb. 22, 23.—ARKANSAS ENGINEERING SOCIETY.** Annual meeting, Helena, Ark. Secretary-Treasurer, W. J. Parkes, Citizens' Bank Bldg., Pine Bluff, Ark.

**Feb. 28-March 3.—AMERICAN ROAD BUILDERS' ASSOCIATION.** Thirteenth annual convention, including sixth American Good Roads Congress and seventh National Goods Roads Show of Machinery and Materials, Pittsburgh, Pa.

**Feb. 29-March 4.—TENTH ANNUAL MID-WEST CEMENT SHOW,** Omaha, Neb.

**March 23, 24.—FLORIDA STATE GOOD ROADS ASSOCIATION.** Annual convention, St. Augustine.

**May 8-10.—SOUTHWESTERN WATER WORKS ASSOCIATION.** Annual convention, Waco, Tex. Secretary, E. L. Fulkerson, Waco, Tex.

**May 10-17.—NATIONAL CONFERENCE OF CHARITIES AND CORRECTIONS.**—Annual conference, Indianapolis, Ind.

**June 4-8.—AMERICAN WATER WORKS ASSOCIATION.** Thirty-sixth annual convention, New York, N. Y. Secretary, J. M. Diven, 47 State Street, Troy, N. Y.

**June 15, 16.—OHIO SOCIETY OF MECHANICAL, STEAM AND ELECTRICAL ENGINEERS.** Convention, Cleveland, O. President, Joseph L. Skeldon, Toledo.

**Sept. 6-9.—LEAGUE OF AMERICAN MUNICIPALITIES.** Annual convention, Newark, N. J.

### National Conference on Concrete Road Building.

The convention of the National Conference on Concrete Road Building will be held at the Auditorium Hotel, Chicago, February 15-18. The program is as follows:

Tuesday, Feb. 15, 10 A. M.—Reception and registration of delegates and visitors. Committee meetings.

2.30 P. M.—Address, "The National Conference on Concrete Road Building," W. F. M. Goss, Dean College of Engineering, University of Illinois; "Motor Haulage and Good Roads," Walter W. Wardrop, editor and publisher The Power Wagon, Chicago; "Building America's Highways," Henry B. Joy, president, the Lincoln Highway; "The Value of Permanent Highways for National Defense," Amos A. Fries, major corps of engineers, War Department.

Second Session, Wednesday, Feb. 16, 10 A. M.—F. E. Turneaure, Dean, College of Engineering, University of Wisconsin, presiding. Reports of committees: 1, Drainage and Preparation of Subgrade; 2, Economical Widths of Pavement and Shoulders; 3, Problems of Design, Thickness, Crown and Grade.

Third Session, Wednesday, Feb. 16, 2 P. M.—Paul D. Sargent, chief en-

gineer, Maine State Highway Commission, presiding. Reports of committees: 4, Aggregates; 5, Handling and Hauling Materials and Water Supply; 6, Organization of Concreting Crew; 7, Proportions of Materials and Consistency of Concrete.

Fourth Session, Thursday, Feb. 17, 10 A. M.—Hector J. Hughes, Professor of Civil Engineering, Harvard University, and Massachusetts Institute of Technology, presiding. Address, "Maintenance Bonds for Concrete Roads," Edward Hoopes, Fidelity & Deposit Co. of Maryland; reports of committees: 8, Mixing and Placing Concrete; 9, Reinforcement; 10, Joint Location and Construction.

Fifth Session, Thursday, Feb. 17, 2 P. M.—H. Eltinge Breed, First Deputy Commissioner, New York State Highway Commission, presiding. Reports of committees: 11, Expansion and Contraction; 12, Finishing and Curing; 13, Construction of Shoulders and Curbs; 14, Methods and Cost of Maintenance.

Sixth Session, Friday, Feb. 18, 10 A. M.—W. F. M. Goss, Dean, College of Engineering, University of Illinois, presiding. Report of committees: 15, Form of Specifications; 16, Cost of Construction; 17, Estimating and Inspection Problems. Report of committee on resolutions.

### American Road Builders' Association.

Invitations have been sent to the governors of the several States of the Union, and to the lieutenant-governors of the provinces of Canada, with the request that they attend and appoint delegates to the Thirteenth Annual Convention of the American Road Builders' Association, to be held in Pittsburgh, Pa., during the week beginning February 28.

Mayor Armstrong of Pittsburgh has shown special interest in the convention, and has sent out a personal invitation to the mayors of some three thousand other cities to attend in person, and also to appoint delegates, including the city engineer and superintendent of streets, or similar officials. Invitations are also being sent out to the road officials of the different states.

Announcement has been made that the Trunk Line Association has granted a rate of two cents per mile from points in its territory to Pittsburgh and return. To secure the reduction passengers must travel both ways over the same route, and return to the starting point not later than March 7. Tickets will be on sale Feb. 26, 27 and 28. Negotiations are pending, and it is expected that similar concessions will be granted by the New England Passenger Association, and the Central Passenger Association. Practically all routes leading to Pittsburgh are embraced in the several associations.

Arrangements are being made for Special Good Roads trains to carry of-

ficials, delegates and others to the convention. It is expected that arrangements will shortly be concluded so that special Pullman cars coming from different cities may be assembled at central points and taken as special trains to Pittsburgh.

Provisions are also pending for the accommodation of special parties who wish to travel together to the convention city. Details, including the time of departure from various points East and West will soon be announced.

The city of Pittsburgh is expending \$22,000 in putting Mechanical Hall in first-class condition for convention purposes. The improvements include a new concrete floor, a new heating plant and other changes. The thirteenth annual convention of the American Road Builders' Association and the Seventh Good Roads Show will be the first meeting to be held there after the improvements have been made.

The program for the meetings of the congress is as follows:

Monday, Feb. 28.—Registration of delegates during afternoon and evening. Meeting at Memorial Hall at 8 o'clock.

Tuesday, Feb. 29, 10 A. M.—Appointment of committees; congress called to order by the president at 11 A. M.; address of welcome and responses.

Tuesday, Feb. 29, 2.30 P. M.—"Railway Track Construction in Paved Streets," by R. Keith Compton, chairman, Paving Commission, Baltimore; "The Control of Openings in Pavements," by N. S. Sprague, Superintendent, Bureau of Engineering, Pittsburgh.

Wednesday, March 1, 10 A. M.—"Recent Developments in the Building of Concrete Roads," by W. D. Uhler, Chief Engineer, Pennsylvania State Highway Department; "A Contractor's Suggestion to Engineers and Inspectors," by John H. Gordon, Albany, N. Y.

Wednesday, March 1, 2.30 P. M.—"Adaptability of Paving Materials to Different Conditions and Localities," by F. C. Pillsbury, Division Engineer, Massachusetts Highway Commission; "Roads at Low Cost for Moderate Traffic," by Frederick E. Everett, State Highway Commissioner of New Hampshire. Annual A. R. B. A. dinner and entertainment, Hotel William Penn, 7 o'clock.

Thursday, March 2, 10 A. M.—"Brick Streets and Roads," by H. E. Breed, First Deputy Commissioner, New York State Commission of Highways; "Recent Tendencies in Stone Block Pavements," by Charles F. Knowlton, manager, paving department, Simpson Brothers Corporation, Boston, Mass.

Thursday, March 2, 2 P. M.—Automobile trip (weather permitting); business meeting; reports of committees.

Friday, March 3, 10 A. M.—"The Columbia Highway," by Henry L. Bowlby, former State Highway Engineer of Oregon; "The Du Pont Road," by Charles M. Upham, Chief Engineer Coleman Du Pont Road.

Col. E. A. Stevens, State Commissioner of Public Roads, of New Jersey, was elected president of the American Road Builders' Association at its annual meeting held at the Automobile Club of America, New York, N. Y., on Friday, February 4. Other officers were elected as follows: First vice-president, Arthur W. Dean, chief engineer, Massachusetts Highway Commission; second vice-president, Austin B. Fletcher, state highway engineer of California; third vice-president, William H. Connell, chief, Bureau of Highways and Street Cleaning, Philadelphia, Pa.; secretary, E. L. Powers, editor "Good Roads"; treasurer, W. W. Crosby, consulting engineer, Baltimore, Md. Directors for three years were elected as follows: William D. Uhler, chief engineer, Pennsylvania State Highway Department; R. A. Meeker, state highway engineer of New Jersey; Governor Charles W. Gates of Vermont; R. Keith Compton, chairman and consulting engineer, Paving Commission, Baltimore, Md.; James H. MacDonald, former state highway commissioner of Connecticut; Frank M. Williams, state engineer and surveyor of New York.

At the dinner held in the Automobile Club's banquet room at half past six, Nelson P. Lewis, chairman of the executive committee of the association, made the principal address. During his re-

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## PERSONALS

Butler, George H., chief of the Malden, Mass., fire department, died January 30 from injuries received about ten days ago while fighting a fire.

Mack, Michael J., at one time city surveyor of New York, died January 23 of heart failure. Mr. Mack had charge of the first sewer construction in Williamsburgh, before it became a part of New York.

Moore, Charles C., mayor of Yuma, Ariz., died of heart disease January 22 during excitement brought on by the breaking of levees by high water and the resulting flood.

Adams, James, has been appointed assistant city engineer of Binghamton, succeeding the late S. F. Jacques.

Barker, R. M., has been appointed city engineer of Greenville, Ky.

Bemis, Edward W., has been dismissed from the Chicago, Ill., traction board by Mayor Thompson.

Bennett, William B., has been appointed city engineer of Niagara Falls, N. Y., succeeding F. S. Parkhurst, Jr.

Blatz, Francis J., of Plainfield, has been elected president of the Joint Sewer Commission.

Blinn, Ray S., formerly city engineer of Mt. Vernon, Ohio, is now city manager of Westerville, Ohio.

Carter, George H., has been elected

chief of the Marlin, Tex., fire department.

Cornwell, S. C., resigned as city manager of Hickory, N. C., to take effect February 1.

Covell, W. H., Jr., has resigned as a member of the Providence, R. I., park commission to become a member of the fire commission.

Gorman, Patrick, has been elected mayor of Huntingdon, Ind., succeeding P. M. McCartney, who resigned because of ill health.

Guyn, J. White, has been reappointed city engineer of Lexington, Ky.

Kuhnle, Edward F., has been appointed fire chief of Port Clinton, O.

McClure, H. C., has been appointed city commissioner of engineering of Toledo, O.

Mills, Charles, assistant fire chief of Oneida, N. Y., has resigned to take a better position at Sherrill, N. Y.

Murphy, William J., has been elected chief of police of Sharpsburg, Pa.

Prine, J. W., formerly postmaster, has been elected city manager of Ash-tabula, O.

Reardon, Timothy A., was re-elected president of the board of public works, San Francisco, Cal.

Schofield, James W., has been appointed chief of police of Cohoes, N. Y., succeeding John Jameson, recently appointed deputy sheriff.

Shores, C. W., has been appointed

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## MUNICIPAL INDEX

(Continued from page 216.)

### GOVERNMENT AND FINANCE.

The Ashtabula Plan—The Latest Step in Municipal Organization. By Augustus R. Hatton. 7,000 words. National Municipal Review, January. \$1.25.

The Administration of European Cities. A brief outline of the administration in several important foreign cities. 20 pages. Journal of Association of Engineering Societies, December. 30 cts.

New York City's Civil Service. The late investigation of the administration of the civil service law in New York City. By Nelson S. Spencer. 6,500 words. National Municipal Review, January. \$1.25.

Centralized Purchasing in New York City. A notable example of effective co-operation between independent units and the city government. Experience of interests to other municipalities desiring increased efficiency in purchasing supplies and equipment. By Henry Bruere. 4,000 words. American City, January. 35 cents.

Depreciation of Property. The first of a series on accounting and finance. The principal sub-divisions are: Explanation of depreciation, fluctuation and amortization; classes of depreciation; methods of providing for depreciation; methods of showing depreciation on the books; necessity of proper provision for depreciation. By W. D. Curtis. 9,500 words. General Electric Review, December. 20 cents.

### BRIDGES

Making the Earthwork Approach to Columbia River Bridge. Very heavy hydraulic earthwork fill against a batter-board system at bridge approaches at Portland. By E. E. Howard. 6 ills. 3,000 words. Engineering News, January 27. 15 cents.

Data on the Distribution of Loads on Highway Bridges With Wooden Floors. Gives results of some experiments made at Iowa State College. 3 ills. 1,200 words. Engineering and Contracting, January 26. 10 cents.

Field Surveys for Highway Bridges. Information concerning conditions at the bridge site is necessary. Kind of information required. By N. B. Garver. 1,200

words. Better Roads and Streets, December. 15 cents.

Building a Reinforced Concrete Arch Bridge at Indianapolis. New structure being erected on site of former failures presents interesting excavation and concrete placing features. By Charles P. Stivers. 6 ills. 3,000 words. The Contractor, January 1. 20 cents.

Design of the Massachusetts Street Bridge Over the Kansas River at Lawrence, Kansas. Describes and illustrates design of 1,026-foot bridge of reinforced concrete. The foundation work was especially difficult. 4 ills. 4,000 words. Engineering and Contracting, January 12. 10 cents.

Q Street Bridge at Washington. Description of a highly ornamental concrete arch bridge across Rock creek gorge at Washington. 3 ills. 1,400 words. Engineering News, January 6. 15 cents.

Quebec Bridge Erection Progress for 1915. Completion of north cantilever and entire south anchor arm. Making ready for work on suspended span. By H. P. Borden. 5 ills. 1,500 words. Engineering News, January 6. 15 cents.

Reinforced-Concrete Street Viaduct at Denver. Is designed to permit free expansion and possible unequal settlement of foundations. Structure is divided into towers connected by suspended spans. 7 ills. 2,500 words. Engineering News, January 27. 15 cents.

### MISCELLANEOUS

Masonry Dams. Various types are briefly described, emphasizing outstanding and distinctive features. Examples cited and materials discussed. From a paper by A. P. Davis and D. C. Henny. 4,000 words. Canadian Engineer, January 27. 15 cents.

Analysis of the Failure of an Earth-Fill Dam. Discussion of the causes of failure of the Hatchtown dam on the Sevier river, Utah. By Guy Sterling. 7 ills. 4,800 words. Engineering News, January 13. 15 cents.

New Construction Work May Be Carried on in Winter. Points out some practical features of planning winter work and of keeping men employed. 2,000 words. The Contractor, January 1. 20 cents.

How Scientific Management is Applied to Construction. The eighth of a series of articles on the application of effi-

ciency principles to contracting fields. By Daniel J. Hauer. The Contractor, December 15. 3,000 words. 20 cents.

Scientific Management in Planning Construction Job. The ninth in a series of articles on scientific management for the contractor. This article takes up the application of improved management in detail, showing how greater efficiency may be obtained. By Daniel J. Hauer. 3,500 words. The Contractor, January 15. 20 cents.

Some Recent Legal Decisions of Engineering Interest. 800 words. Engineering News, January 27. 15 cents.

Canal Excavation with Electric Drag-Line Scrapers. Low unit cost for excavating 1,500,000 cubic yards in two seasons with two machines at Great Falls, Montana. 4 ills. 1,800 words. Electrical World, January 29. 10 cents.

Tunnel Lining by Compressed Air Mixing and Placing. Describes type, size and properties of apparatus; gives examples of tunnel lining work; showing plant arrangement, output, durability and costs. 8 ills. 8,000 words. Engineering and Contracting, January 12. 10 cents.

Factors Affecting the Life of Concrete Structures. A review of possible causes of destruction of plain and reinforced concrete and suggested remedies. 5,500 words. Canadian Engineer, January 27. 15 cents.

Requirements for Acceptance of Concrete Aggregate Based Upon Standard Tests. Materials testing division of New York Public Service Commission develops methods for continuous sampling and testing of concrete. 2 ills. 4,000 words. Engineering Record, January 8. 10 cents.

Field Lithography Permits Rapid Production of Maps. Zincography, a process specially developed by army engineers, does away with blue printing. Zinc plate can be engraved in less than half an hour and several impressions per minute made. By D. A. Tomlinson. 1,000 words. Engineering Record, January 8. 10 cents.

Preparing to Abolish the Mosquito. What some communities have done; control measures. 5 ills. 6,000 words. The American City, January. 35 cents.

Storage, Sale and Handling of Gasoline and Explosives. By Roger W. Wallace, Deputy State Fire Marshal of Indiana. 3,000 words. Fire and Water Engineering, January 12. 10 cents.

# NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

## SAND TESTER.

### For Grading and Cleanliness—Simple Graphical Record.

The increased demand for better concrete work has turned attention to better and more uniform materials and consequently to more efficient methods of testing them. Until recently sand has been a rather neglected factor, but now both field and laboratory tests are used for more effective control. The variability of sand from different deposits or even from the same deposit, and the resulting effects on the concrete necessitates constant testing, but the cumbersome apparatus hitherto used has prevented field testing from being as extensive as desirable.

The Universal sand tester is designed to determine grading and cleanness. Both these qualities are important in sand for concrete work and the first is of particular importance in filter-bed sands. The tester consists essentially of a graded series of standard mesh screens (Nos. 6, 10, 20, 30 and 60) in a water tight casing; a series of glass vials communicating with the screen and means for holding and making a graphical record of tests. The main advantage claimed for this tester is simplicity of operation in every respect.

The principal points of simplicity are: Wet screening instead of dry screening; measurement of absolutely wet materials; drawing a pencil along an index and across a prepared record sheet instead of reading figures, computing percentages and plotting curves; duplicate or triplicate copies may be made at once; tests may be made right at the sand pile instead of having samples shipped to the laboratory; employees of average intelligence may do testing efficiently.

In operation a small metal measure filled with the sand is emptied into the casing through an opening in one end and through the same opening water is poured until it shows above the first screen. The instrument is held between the hands, vial side up, and a reciprocating motion is given fifteen or twenty times, impulsing toward the left-hand end of the stroke. This causes coarse separation of sand particles by wave action of the water. The finer separation is completed by holding the instrument in inclined position in one hand and pulsing the rubber bulb at the lower end with the other. The tester is turned vial side down and shaken gently to wash the materials from the screens. The instrument is turned into vertical position, the materials flowing into the glass vials, gently shaking to insure absolute deposition. The record sheets are put on

the platen and by successive placing of the index on top of the sand in successive vials, drawing pencil line along index across record sheet each time and placing this pencil line successively level with the bottom of the next succeeding vial, the record sheet is formed. On standard record sheets red bands indicate the proper location of index lines of best results. These have been determined as closely as possible from established gradings for maximum density, with sands having  $\frac{1}{4}$ -inch maximum size of particle. It is recommended, however, that the grading desired for any given sand source be first established by laboratory procedure and specially marked sheets can thus be obtained.

Testers for filter-bed sands are supplied with special screens.

The accompanying illustration shows the Universal sand tester, which is made by the Concrete Appliance Company, Inc., 149 Broadway, New York, N. Y.



THE UNIVERSAL SAND TESTER.

## NOVALUX LIGHTING.

### Pendent Street Units for Mazda Series Lamps.

One of the far-reaching recent developments in street lighting has undoubtedly been the increasing use of the new high candle-power incandescent lamps. The high efficiencies of these lamps, the less need of attention and the simpler handling have already made the new units very popular for street lighting. The filament is a closely wound coil of drawn tungsten wire of great strength operating in an atmosphere of gas which enables it to be run at very high temperatures without decreased life. The high temperatures necessitate that all lamps rated 400 c. p. or over, be operated in ventilated fixtures equipped with globes to protect the lamp bulb from the effects of moisture and atmospheric changes. The extreme concentration of the filament produces high intrinsic brilliancy and consequent glare unless globes of diffusing glass are used to conceal the light source and improve the distribution. These characteristics have necessitated naturally a new line of fixtures adapted to the use of the lamps. These fixtures are in three styles: Pendent units for high candle-power lamps, ornamental units for high candle-power lamps, and bracket units for low candle-power lamps.

Novalux pendent units are designed

to accommodate 5.5, 6.6 and 7.5 ampere series lamps for operation in constant current circuits, and 400, 500, 750 and 1,000 watt multiple lamps on 110 volt, alternating or direct current multiple circuits. The efficiency of the 15 and 20 ampere Mazda series lamps is much higher than that of the 6.6 ampere lamps and therefore in the line of pen-

dent units is included a type which contains an internal individual auto-transformer to operate the 15 and 20 ampere lamps on 6.6 or 7.5 ampere circuits, thus saving 20 to 30 per cent. of the energy required.

Auto-transformers are made for use with the 15 ampere 400 c. p. and the 20 ampere 600 and 1,000 c. p. series Mazda lamps on 6.6 and 7.5 series alternating constant current circuits. They are mounted inside the unit directly under the hood and are properly ventilated. A fixture complete for operating a 600 c.p. Mazda lamp at 20 amperes with an individual auto-transformer and a proper reflector, gives about twice as much light as the 7.5 ampere carbon enclosed arc lamp and consumes 30 per cent. less energy. Under proper conditions the life of the lamp should average about 1,350 hours and the candle power will not decrease below 80 per cent. during that period. These advantages and others are some which have appealed to central stations in changing to these new units.

An external reflector, made of steel with a white fire-enamel reflecting surface, is used to secure the most efficient street lighting distribution. The pendent unit is so designed as to permit the entrance of a sufficiently large flow of air to maintain the bulb at a proper operating temperature. The air strikes the neck of the lamp bulb and circulates through the shell and around the socket, leaving through concealed openings at the top of the unit. Both the inlet and

outlet openings are so arranged as to preclude the possibility of any moisture entering the globe or unit. The sockets used with these units are especially designed to withstand the higher temperature conditions obtaining.

The pendent units are of graceful design and in three forms. There are two general types, long casing and short casing. Form 1 units resemble the arc lamp in appearance and weight. The dome is a heavy iron casting finished with black japan and supports the auto-transformer and socket. The casing is made of heavy rolled copper with a black oxidized finish or of sheet steel with a double coating of black japan. The prismatic reflector consists of the arc lamp-shaped units, fitted into a weatherproof union. The outside bowl carries on its inner surface a series of vertical prisms and the inner bowl is girdled by horizontal prisms. As the prisms are within the glass, the refractor is easily kept clean. The light rays are refracted at useful angles by the inner bowl and the light is diffused and uniformly distributed in the horizontal plane by the outer.

Form 2 units are very attractive, the line is comprehensive and the possible glassware combinations leave adequate choice. These units have the same characteristics as the Form 1 units, but are lighter in weight and are less expensive. The dome is of double coated black japanned cast iron and the casting is of spun copper. Concentric or radial wave reflectors are used.

Form 6 units (the latest form) are made in two general types, bracket and pendent, and may be used with either open or concealed wiring. The bracket type is equipped with the same insulator that is used with the series incandescent brackets—it will stand voltage strains up to 25,000 volts. The illuminating characteristics are practically the same as those of Form 1 units. The method of ventilation is



NOVALUX PENDENT UNIT WITH REFLECTOR AND PRISMATIC REFRACTOR.

novel. The globe seat is made air tight and the air enters through fine mesh-protected openings under the lower flange of the casing near the globe, circulates around the socket, and leaves through fine-mesh protected openings under the dome of the lamp.

The accompanying illustrations show a Form 6 pendent unit with concentric reflector and prismatic refractor and a bracket unit with light Carrara globe and concentric reflector. These Novalux units are made by the General Electric Company, Schenectady, N. Y.

## INDUSTRIAL NEWS

**Cast Iron Pipe.**—Chicago—At St. Paul, 2,560 tons of pipe has been awarded to the leading interest, which company has also taken 300 tons at Fort Wayne, Ind. New business includes 1,500 tons of 60-inch for Milwaukee, February 3, and 1,700 tons for the same city on February 9. At Duluth, contracts for 1,000 tons are to be placed. Quotations: 4-inch, \$32.50 to \$33.00; 6-inch and larger, \$29.50 to \$30.00; Class A, \$1 extra. Birmingham—Pipe manufacturers are satisfied with the progress of winter business. Additional orders from western municipalities have been received and the inquiry is rather brisk. Quotations: 4-inch, \$27; 6-inch and up, \$25. San Francisco—Current business is not heavy, the largest inquiry being for 500 tons for a Los Angeles water district. Douglas, Ariz., is taking bids on a few cars of 4 and 6-inch pipe, and Santa Ana took bids February 6 on 250 tons. The number of towns voting on new water system projects is encouraging. Quotations: 4-inch, \$38; 6-inch and over, \$35; Class A, \$1 extra. New York—The only municipal lettings of importance are those of Pawtucket, R. I., bids on which were opened February 9 for 450 tons, and Lewiston, N. Y., bids on which are to be opened on February 15 for 500 tons. While public lettings are few and call for comparatively insignificant quantities, the volume of private buying continues excellent. Founders report the past month as one of the best in their history in the aggregate of business booked. Quotations: 6-inch, Class B and heavier, \$29 per net ton; Class A, \$30.

**Lead.**—Prices have been held up by the foreign demand, and an advance is now looked for. Quotations: New York, 6.10 cents; St. Louis, 6.00.

**The Trussed Concrete Steel Company,** Detroit, Mich., has issued a new catalogue describing the Kahn portable steel buildings. The principle of the design of these buildings is claimed to be new and original and the resulting structures are substantial. The field of usefulness covers a wide range, including buildings from the smallest garage to large general shops for manufacturing purposes, contractors' houses, tool and store buildings, hospital buildings, factories, summer cottages, boathouses,

election booths, etc. The units of construction used and the various types of buildings are interestingly illustrated.

**The Pioneer Asphalt Company,** Lawrenceville, Ill., has issued a neat folder illustrating and describing the use and properties of Pioneer asphalts. Highways in Chicago, Philadelphia, Lansing, Mich., Hammond, Ind., Northampton, Pa., and Winnipeg, Man., are represented among the examples shown.

**Automobile Products.**—Recent figures of the amounts of various products used in last year's output of automobiles are an interesting index of the progress of the industry. For instance, 760,000 tons of fabricated steel were used; 8,450,000 board feet of manufactured wood; 67,232 leather hides; 3,280,000 square yards of imitation leather; 11,405,250 yards of top material and linings, and 489,356 yards of burlap. The automobile output of 1915 brought in the retail market \$691,778,950.

## NEWS OF THE SOCIETIES

(Continued from page 218.)

marks he presented the resolutions adopted by this and other associations, and the correspondence concerning them, in chronological order, so as to correct any possible misunderstanding or misapprehension regarding any agreements relative to the holding of the association's annual convention and seventh good roads show at Pittsburgh, Pa., during the week of February 28, as the Seventh American Good Roads Congress. The record was conclusive as to the entire good faith of the American Road Builders' Association.

Retiring President George W. Tillson, who acted as toastmaster, spoke briefly of the Pan-American Road Con-



NOVALUX BRACKET UNIT WITH REFLECTOR AND CARRARA GLOBE.

gress and the road work in the west. Col. Stevens, the incoming president, acknowledged his election and spoke at some length on technical phases of road building, putting special emphasis upon the necessity of proper records. In closing his remarks, he called attention to the necessity for including data on speed in traffic records. Other speakers were Charles Whiting Baker, of "Engineering News"; H. M. Swetland, of "The Automobile," and Elmer Thompson, secretary of the Automobile Club of America. Mr. Baker congratulated the association and Col. Stevens upon the election of the president and touched upon the subject of federal aid. Mr. Swetland called attention to the necessity for building roads for automobile traffic instead of for horse-drawn traffic, and proposed for New York City a north and south elevated roadway for automobile traffic. At the suggestion of former State Highway Commissioner MacDonald of Connecticut, at the close of the speaking, rising votes of thanks to the Automobile Club of America for its hospitality and to Mr. Tillson for his work as president during 1915 were taken.

#### Montana Institute of Municipal Engineers.

The Montana Institute of Municipal Engineers held their fourth annual meeting at Billings, Mont., Jan. 17-19, 1916. The first day two papers were presented. "Street Paving," by W. B. Vestal, Jr., of Anaconda, was a brief digest of the different types of standard pavements, and was followed by a discussion by J. N. Edy of Billings. The discussion of "Improvement District Laws" was ably handled by H. M. Sprague of Great Falls, and E. S. Severance of Glasgow. Tuesday morning there were moving picture talks by Prof. Leon D. Conkling of the Montana State College on "State Highways," by Mr. Young of the National Tube Co. on the "Manufacture of Their Product," and by Mr. Bailey of the Red Devil Cement Co. on the "Concrete Farm." Tuesday afternoon Dr. Koyle, water expert for the Great Northern Railway, spoke on "Water Softening and Purification"; Mr. Davidson, of the Montana College, on "Standard Methods for Testing Sewage and Sewage Effluents"; M. L. Morris of Great Falls on "Parks and Playgrounds"; State Horticulturist Dean on "Preservation of Trees"; G. C. Bruett of Miles City presented a digest of the different methods of sewage disposal giving approximate costs attached to each operation.

Wednesday morning F. C. Snow spoke on "Activated Sludge Process of Sewage Treatment," and Chief Engineer Smith of Burns & McDonnell of Kansas City gave an illustrated talk on "Water Works Installation." On Wednesday afternoon the Institute inspected the new filter plant connected with the Billings Water Works. Officers for 1916 were elected as follows: President, Carl C. Widener, Bozeman, Mont.; vice-president, C. W. Helmick,

Helena, Mont.; secretary-treasurer, John N. Edy, Billings, Mont.; director, M. L. Morris, Great Falls; director, F. C. Snow, Bozeman.

#### Engineering Society of Northwestern Pennsylvania.

The annual meeting of the Engineers' Society of Northwestern Pennsylvania was held at Erie, Jan. 11.

After the dinner the various officers and committee chairmen submitted reports on the work done during the past year. Three new members were elected.

Mr. Dunwoody, the retiring president, gave a short talk on "Co-operation in the Engineering Profession," before introducing Mr. H. H. Clemens as the newly elected head of the Society.

Mr. Clemens addressed the Society on "Future Possibilities."

#### Iowa Good Road Meeting.

One of the largest meetings ever held in Iowa at which Iowa roads are the chief and only subject will be held in Des Moines February 18.

The proponents of the meeting expect a large attendance at the meeting. Behind the plan and working actively for it are the roads committee of the Iowa Bankers' Association, the Great Iowa association, the Greater Des Moines committee, the Jefferson and Lincoln Highway associations and all other road associations in the state and the commercial organizations of many of the cities in the state besides Des Moines, and the Des Moines Auto Show.

Plans for the meeting are being worked out by F. C. Carson of Iowa City, E. H. Spalding of Grinnell and W. A. Hopkins of Lamoni. The meeting will be held in connection with the Des Moines Auto show and in co-operation with it.

Tentative plans now include on the program of speakers the members of Gov. George W. Clarke's better road commission and the state highway commission.

#### Pennsylvania Engineers' Society.

The Engineers' Society met Jan. 14 in their annual session at Harrisburg and submitted reports of officials and standing committees. New officers elected in December were installed as follows:

President, R. Boone Abbott; first vice-president, W. W. Davis; second vice-president, Morris Knowles; resident directors, Frank A. Robbins and David E. Tracy; non-resident director, Elkton D. Waller, of State College; treasurer, John O'Connell; secretary, E. R. Dasher.

Committees and their chairmen, to serve during the ensuing year, follow:

Auditing, John B. Corl; finance, Thomas Earle; House, Frank A. Robbins, Jr., (chairman), John E. Erickson (secretary) and Paul Gendell, house manager; entertainment, Charles E. Ryder; library, H. E. Moses; lecture, Charles P. Turner; publication, Carl Willis Davis.

Farley Gannett, retiring president, spoke at length on the benefit the organization has done engineers, declaring that the club had been of inestimable value in fostering personal friendship and acquaintanceship among engineer employees of the state.

## PERSONALS

(Continued from page 218.)

chief of police of Salt Lake City, Utah.

Van Dusen, C. S., has been appointed chief of the Roselle, N. J., fire department.

Young, Nelson E., has been elected health officer of Williamsport, Pa.

Zuber, E. M. J., has been reappointed borough engineer of Woodridge, N. J.

Tracy, Joseph M., has been appointed city engineer of Ogden, Utah.

Commissioner Henry W. Hodge of the public service commission for the first district, New York, has appointed Robert W. Boyd his private secretary. Mr. Boyd has been in independent consulting engineering practice in New York and was for a time in partnership with Rudolph Miller, who resigned to become superintendent of buildings of the borough of Manhattan.

The board of supervisors has appointed the following engineers to be members of the board to investigate sanitary conditions in Los Angeles county, Cal., and report upon a plan for sewage disposal: Charles Gilman Hyde, professor of sanitary engineering of the state university; Thomas A. Gillespie, sanitary engineer of the state board of health; A. H. Koebig, George P. Robinson and A. M. Brosius.

During the week Governor Whitman appointed Travis H. Whitney, the present secretary of the public service commission for the first district, New York, as public service commissioner, to succeed J. Sergeant Cram, whose term expired February 1; and Charles S. Hervey, deputy comptroller of the city of New York, as public service commissioner, to succeed George V. S. Williams, who resigned January 31. Governor Whitman has now made five appointments to this commission—the full membership.

Saxton, Edmund F., recently assistant director of the department of wharves, docks and ferries of Philadelphia, and formerly chief engineer of the United Railways of Yucatan, including the port of Progreso, and for over fifteen years in charge of testing laboratories; railroad location and betterment; reports, reinforced concrete, bridge construction, docks, piers and harbor work, begs to announce the opening of offices to conduct a general consulting engineering practice at the Pennsylvania Building, Philadelphia, Pa. Special attention will be given to municipal problems—valuations, railways, ocean and river piers and wharves, design, testing, supervision and construction of general work, and projects in Latin-American countries are solicited.

# ADVANCE CONTRACT NEWS

## ADVANCED INFORMATION BIDS ASKED FOR

## CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
Ind., Indianapolis	10 a.m., Feb.	12..	Grading, draining and paving with gravel.....	L. K. Fesler, Co. Aud.
Minn., Duluth	11 a.m., Feb.	12..	Improving streets.....	W. H. Borgen, City Clerk
Tex., Houston	10 a.m., Feb.	14..	Treating 1,800 feet with shell.....	H. L. Washburn, County Aud.
Ala., Camden	Feb.	14..	Constructing sand-clay and gravel roads.....	J. M. Stanford, Probate Judge
Ala., Hayneville	Feb.	14..	Road construction.....	J. M. Garrett, Montgomery Board of County Supervisors
Cal., Ventura	Feb.	14..	Grading and culverts on two miles of road.....	J. W. Ball, Hwy. Engr.
Wash., Stevenson	1.30 p.m., Feb.	14..	Constructing county road.....	City Engineer.
Mich., Lansing	4 p.m., Feb.	14..	Furnishing stationary asphalt plant.....	County Clerk.
Mich., Ann Arbor	Feb.	14..	Constructing 9 pieces of road.....	A. Hohenstein, Pur. Agt.
Minn., St. Paul	10.30 a.m., Feb.	14..	Crushed granite or trap and crushed limestone supplies.....	W. R. Roy, St. Hwy. Comr.
Wash., Olympia	Feb.	14..	Grading and draining 10 miles of highway.....	County Commissioners
Wash., Everett	Feb.	14..	Graveling road.....	
La., Eldora	Feb.	14..	11,979 yds. of conc., 10,720 yds. of asphaltic conc., 10,712 yds. bitulithic and 915 yds. conc. pavements.....	E. L. Chamberlain, City Engr.
Kans., Kansas City	Feb.	14..	Grading and macadamizing road.....	F. M. Holcomb, Co. Clerk.
Minn., St. Peter	8 p.m., Feb.	14..	Constructing and improving streets.....	M. E. Stone, City Clerk.
N. D., Minot	2 p.m., Feb.	14..	Furnishing 12 or less dump wagons, two road graders and steel culverts of all sizes.....	L. J. Thompson, Co. Aud.
Fla., Gulfport	Feb.	15..	Constructing 2 miles modified asphalt street and dock, estimated cost, \$18,000.....	N. D. McKinney, Town Clk.
Wis., New London	8 p.m., Feb.	15..	Furnishing 235,000 sq. ft. reinforcing metal and constructing concrete pavement.....	C. J. Thompson, City Clerk.
Kan., McPherson	Feb.	15..	19,500 sq. yds. brick pavement and 6,000 ft. curb and gutter.....	H. A. Rowland, Engineer.
Pa., Bath	Noon, Feb.	15..	15,000 yds. concrete or brick paving.....	C. L. Hunter, Twn. Recorder
Wis., Wausau	Feb.	15..	Laying 30,000 yds. brick pavement.....	City Clerk
Wash., Spokane	Feb.	15..	200,000 cu. yds. of excavation and 200,000 sq. yds. of various pavements.....	J. W. Strack, Co. Engr.
La., Spencer	Feb.	15..	Laving 50,000 sq. yds. hard surface pave., cost \$50,000.....	E. O'Keefe, City Engr.
Minn., St. Peter	Noon, Feb.	15..	Dragging and maintaining state road in Nicollet county.....	W. H. Holz, Co. Aud.
Minn., St. Cloud	3 p.m., Feb.	15..	Const. 1,800 sq. yds. creosoted wood blk. pave. on bridge.....	G. G. Magnuson, City Clerk
Cal., Santa Monica	Feb.	15..	Laying 170,000 sq. yds. concrete pavement.....	City Clerk.
Kan., Council Grove	4 p.m., Feb.	15..	19,500 sq. yds. brick paving and 6,000 feet concrete combined curb and gutter.....	H. A. Rowland, Engineer, McPherson
N. Y., Brooklyn	11 a.m., Feb.	16..	Grading, curbing and laying sidewalks; furnishing 50,000 iron slag paving blocks and 300 tons of paving pitch.....	L. H. Pounds, Boro. Pres.
Ala., Gadsden	Noon, Feb.	16..	Grading and draining 1/2 mile of road.....	County Commissioners
Mo., Union	Noon, Feb.	16..	County road and bridge work.....	J. M. Moore, Hwy. Engineer.
S. D., Mitchell	2 p.m., Feb.	17..	30 to 50 h.p. gas oil tractors and one road grader.....	J. M. Crampton, Co. Auditor.
N. D., Jamestown	2 p.m., Feb.	17..	Constructing highways.....	Andrew Blewett, Co. Auditor
N. J., Prospect Park	8 p.m., Feb.	17..	Grading, curbing and guttering.....	Thomas Fraser, Boro. Pres.
Ind., Muncie	10 a.m., Feb.	19..	Grading and graveling or macadamizing several highways.....	F. M. Williams, Co. Aud.
Wash., Tacoma	Feb.	20..	Const. 8 miles of pavement, estimated cost \$100,000.....	County Commissioners
N. Y., Lestershire	8 p.m., Feb.	21..	Laying brick pavement and constructing curb.....	W. C. Lewis, Village Clerk.
Ala., Camden	Feb.	21..	Constructing 16 miles of gravel road.....	J. N. Stanford, Probate Judge
Kans., Lyons	Feb.	21..	11,000 yds. brick and concrete paving.....	R. S. Turner, City Clerk.
N. J., Camden	8 p.m., Feb.	21..	Paving with belgian blocks, furnishing curbs and crossing stones, repairing brick and cement sidewalk and laying new walks and furnishing one traction engine and roller.....	A. B. Sparks, Ch. Hwy. Committee.
Minn., St. Paul	10 a.m., Feb.	21..	Grading and constructing clay and gravel roads.....	G. J. Ries, Co. Auditor.
Wash., Olympia	Feb.	21..	Grading and draining 10 miles of highway.....	W. R. Roy, St. Hwy. Comr.
Fla., Tallahassee	10 a.m., Feb.	21..	Constructing 32 miles of sand clay roads.....	O. C. Van Brunt, Co. Clerk.
N. J., Elizabeth	2.30 p.m., Feb.	21..	Laying 2,000 yards brick and bituminous pavement.....	J. L. Bauer, County Engineer.
N. J., Bloomfield	8 p.m., Feb.	21..	Const. bluestone curb & asphalt mac. (2,500 yds.) road; 80,000 gals. asphaltic & non-asphaltic road oil.....	Ernest Baechlin, Twn. Engr.
Me., Augusta	Feb.	23..	Constructing 4.12 miles state highway.....	P. D. Sargent, Chief Engr., Highway Com.
Ind., Anderson	10 a.m., Feb.	23..	Constructing concrete and rockmac road.....	E. T. Slahavin, County Auditor.
Ind., Ft. Wayne	10 a.m., Feb.	23..	Constructing macadam roads.....	W. Johnson, Co. Aud.
O., East View	Noon, Feb.	24..	Constructing sidewalks.....	F. A. Pease Engr. Co.
Ind., Evansville	10 a.m., Feb.	24..	Grading, laying and paving road.....	Marshall Bldg., Cleveland.
O., Mt. Gilead	1 p.m., Feb.	25..	Improving roads.....	C. P. Beard, County Auditor
Mo., St. Louis	Noon, Feb.	25..	Constructing wood block pavement, asphalt pavement and granite curbing.....	C. O. Higgins, Co. Auditor
La., Vail	noon, Feb.	27..	Road grading and repair work.....	E. R. Kinsey, Pres. Bd. Pub. Service.
Idaho, Wallace	Feb.	28..	43,825 yards of asphalt and 46,297 yards of concrete.....	H. E. Miller, Township Clerk
Ind., Peru	Noon, Feb.	28..	Grading, draining and paving, and constructing culverts.....	D. M. Fairer, Engr.
Mich., Lansing	4 p.m., Feb.	28..	Furnishing asphalt cement for 1916.....	F. K. McElheny, County Aud.
Ind., Lebanon	Feb.	28..	Paving and constructing walk, cost \$12,757.....	City Engineer.
N. D., Minot	Feb.	28..	Constructing 24,844 sq. yds. first-class pavement.....	Walter Whitecotton, City Eng.
Ark., Little Rock	Mar.	1..	Paving several streets and constructing 48,000 ft. curb and gutter.....	E. J. Thomas, City Engr.
Kan., Atchison	Mar.	1..	Paving several streets.....	Dickinson & Watkins, Engrs
Wis., Appleton	Mar.	1..	6,000 yards of sandstone paving and 10,000 yards brick, asphalt or concrete.....	V. L. King, City Clerk.
Ariz., Globe	Mar.	1..	Constructing 6 miles pavement.....	A. C. Remlev, City Engr.
La., Fort Madison	Mar.	1..	Laying 3 miles brick and concrete pavement.....	R. G. Thomas, Co. Engr.
W. Va., Parkersburg	Mar.	1..	Laying 37,270 sq. yds. brick and 24,898 yds. one course concrete pavement.....	Geo. Anthes, City Clerk.
				T. L. Higgs, City Engineer.

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Minn.	Hibbing	Mar. 2	Constructing road (Hibbing-Chisholm)	P. D. Hawley, City Engineer.
Miss.	Canton	Mar. 6	Constructing 20 miles gravel road	X. A. Kramer, Engineer, Magnolia.
Ind.	Portland	Mar. 6	Constructing concrete road	W. H. Badders, Supt. of Cons.
Ind.	Portland	Mar. 6	Constructing brick road, estimated cost \$26,108.50	O. O. Clayton, Supt. of Const.
Minn.	LeSueur Center	2 p.m., Mar. 6	Five 2 or 4-horse road graders	T. F. Dunn, County Auditor.
Ala.	Huntsville	Mar. 6	Constructing 3 1/2 miles macadam road	M. S. Bingham, Rd. Supv.
Kan.	Atchison	Mar. 6	Laying 8,000 yds. brick and 10,000 yds. concrete paving	Frank Altman, City Engineer.
Wash.	Davenport	Mar. 7	Graveling 13 miles of Sunset Highway	G. G. Harvey, Co. Surveyor
Ind.	Covington	10 a.m., Mar. 8	Constructing stone or gravel roads	H. W. Newlin, Co. Aud.
Ill.	Danville	Mar. 14	Constructing 174 miles of county road	P. C. McArdie, Supv. Engr.
Mo.	Bolivar	Mar. 20	Constructing 10 miles oiled gravel roads	G. M. Upton, Secy. Road Dist.
W. Va.	Charleston	Apr. 1	15,000 yds. brick pavement	J. M. Clark, City Engr.

## SEWERAGE

Ind.	Frankfort	2 p.m., Feb. 12	Constructing 7,216 feet 16 to 22-in. tile ditch	W. E. Lowman, Drain. Comr.
Ind.	Portland	2 p.m., Feb. 12	Constructing county drainage ditch	W. H. Badders, Drainage Supt.
la.	Guthrie Center	1 p.m., Feb. 12	Constructing tile drainage ditch	L. P. Truax, County Aud.
D. C.	Washington	2 p.m., Feb. 14	Const. 125 ft. of 2 1/2 x 3 1/2-ft. brick and concrete sewer	Chief Clk., Engineer's Dept., District Bldg.
D. C.	Washington	2 p.m., Feb. 14	Constructing 1,300 ft. 12-in. sewer	Chief Clerk, Engineer Dept., District Building.
O.	Cincinnati	noon, Feb. 14	Constructing sewers	Ch. Engr., Dept. Pub. Serv.
Ky.	Lexington	10 a.m., Feb. 14	5,100 ft. 5 to 12-in. sewers, const. flush tank & excav.	Comr. Public Works
Minn.	Marshall	10 a.m., Feb. 14	Constructing tile ditch, cost \$7,794	E. S. Shepard, Co. Aud.
Fla.	Jacksonville	Feb. 15	Sewer and drainage work, estimated cost, \$400,000	L. D. Smoot, Comr. Pub. Wks.
D. C.	Washington	10 a.m., Feb. 15	Furnishing terra cotta pipe at Navy Yard	Samuel McGowan, Pay.-Genl.
Minn.	Princeton	11.30 a.m., Feb. 15	Constructing ditch, estimated cost \$4,994	W. C. Doane, Co. Aud.
Pa.	Bath	Noon, Feb. 15	Constructing storm sewers and inlets	C. L. Hunter, Recorder.
la.	Des Moines	Feb. 15	Constructing sewer system, estimated cost \$209,000	F. Carss, City Engineer
Minn.	Jackson	10 a.m., Feb. 15	Constructing tile ditch, cost \$55,256	P. D. McKellar, Co. Aud.
Ark.	McCrory	1 p.m., Feb. 15	Constructing one main and 6 lateral ditches	Newsom Engrg. Co., Wynne
N. Y.	Lewiston	8 p.m., Feb. 15	Laying 400 feet 8-in. sewer	A. C. Peabody, Engr.
la.	Strawberry Point	2 p.m., Feb. 15	Constructing sewer system	T. F. Scofield, Town Clerk
la.	Keota	Feb. 16	Constructing 1 1/2 miles 8 to 10-in. sewers	Iowa Engineering Co., Clinton
Minn.	Mountain Lake	7 p.m., Feb. 17	Sewer system about 15,500 feet long; septic tank	C. W. Gove, Engr., Windom, Minn.
N. J.	North Bergen	Feb. 17	Constructing sewer	Robert Gaw, Engr., 554 Spring St., W. Hoboken.
N. Y.	New York	2 p.m., Feb. 18	Furnishing 1,170 cast iron manhole and receiving basin heads	M. M. Marks, Boro President.
Minn.	Duluth	2 p.m., Feb. 19	Constructing county ditch, cost \$105,715	O. Halden, Co. Auditor.
O.	Brewster	noon, Feb. 19	Constructing sewage disposal plant	W. J. Sherman Co., Nasby Bldg., Toledo.
Ind.	Crawfordsville	10 a.m., Feb. 19	Constructing drainage ditch	M. L. Ness, Drain. Comr.
Wash.	Glen Gray'd	7.30 p.m., Feb. 21	Constructing ditches and drains	R. H. Benn, Secy. Drain. Dist.
Ind.	Hammond	Feb. 21	Constructing Calumet Ave. sewer, 6,580 ft. long and 72 ins. wide; probable cost \$215,000	Jacob Schroeter, Ch. Bd. P. W.
N. J.	Camden	8 p.m., Feb. 21	Inlets, sewer pipe, manholes and other materials to be furnished or work to be done during 1916	A. B. Sparks, Ch. Hwy. Committee.
Cuba	Havana	Feb. 22	Constructing sewerage system, including pumping station for town of Pogolotti; estimated cost \$20,000	Francisco Garcia, Ch. Engr., 24 Cuba St.
la.	Des Moines	Feb. 23	Constructing sewer system, estimated cost \$209,500	D. E. Thomas, Asst. Engr.
J.	East View	Noon, Feb. 24	Constructing sewers in two streets	F. A. Pease Engineering Co., Marshall Bldg., Cleveland, O.
Fla.	West Palm Beach	Feb. 24	Improving sewerage system	A. M. Lopez, City Clerk.
Neb.	Pierce	Feb. 25	Constructing sewer system, cost \$20,000	Bruce & Standeven, Engrs., Bee Bldg., Omaha.
Minn.	Ada	2 p.m., Feb. 25	Constructing county ditch No. 51	D. E. Fulton, Co. Auditor.
Ind.	Kendallville	Feb. 29	Sewer system, requiring 21,891 ft. 8 to 24-in. pipe, 322 ft. 8 to 24-in. c.-i. pipe, 44 manholes, 20 flush tanks, 140 house drains and one sewer lift, estimated cost \$33,845	W. E. Sawyer, City Engr.
W. Va.	Martinsburg	Feb. 29	Sewage disposal system at postoffice	Custodian of Postoffice
Mich.	Grand Rapids	Mar. 1	Constructing Imhoff tank and sludge bed	J. R. Rumsey, Engineer.
Mont.	Polson	Mar. 6	Laying 15,000 ft. 8 to 18-in. sewers	Long & Olsen, Engrs.
Mont.	Billings	Mar. 9	Constructing storm water sewer system, cost \$63,000	E. M. Sneckenberger, City Eng.
Minn.	Moorehead	2 p.m., Mar. 9	Constructing and repairing ditches	A. O. Houghum, Co. Aud.
N. J.	Newark	Mar. 14	Constructing 2,700 ft. Passaic Valley trunk sewer	Passaic Val. Sew. Commission
la.	Wall Lake	Apr. 1	Straightening and deepening river and draining swamp	Seth Dean, Eng., Glenwood.
Mich.	Macon	Apr. 1	Constructing branch of Macon drain	D. S. Sullivan, Co. Drain Comr.
Wis.	Sheboygan Falls	Apr. 1	Constructing 2 miles 8 to 15-in. sewer in eight streets	F. R. Kroeger, City Clerk.
Argentina	Buenos Aires	Apr. 24	Furnishing machinery	Dept. Obras Sanitarias de La Nacion.

## WATER SUPPLY

N. J.	Newark	3.30 p.m., Feb. 13	Meter testing apparatus	M. R. Sherrerd, Chief Engr.
Ill.	Jacksonville	10 a.m., Feb. 14	3,024 feet 6-in. c. i. pipe and fittings	R. L. Pyatt, City Clerk
Ill.	Viola	Feb. 14	Constructing waterworks system	Terhune & Horton, Engrs., Peoria
Kan.	Coffeyville	Feb. 14	Constructing concrete smoke stack 150 feet high	C. E. Stromquist, Supt. W. & L.
Ind.	Columbia	Feb. 14	Improving water works system	Geo. Rader, City Engineer.
Wyo.	Lander	Noon, Feb. 15	Improving water works system	P. B. Gilbert, City Clerk.
O.	Farmersville	Feb. 15	Waterworks supplies	A. F. Gilbert, Vil. Clk.
N. Y.	New York	11 a.m., Feb. 15	Furnishing bronze gate valves for city tunnel of Catskill aqueduct	Geo. Featherstone, Secy. Bd W. S.
N. Y.	Lewiston	8 p.m., Feb. 15	Furnishing 500 tons 4 to 10-in. c. i. pipe, 47 hydrants, 49 valves and valve boxes and pumping equipment; constructing 375,000 gal. filtration plant, 85-ft. steel stand pipe and hauling and laying 29,000 ft. 4 to 10-in. pipe	A. O. Peabody, Engr.
N. H.	Washington	10 a.m., Feb. 15	Furn. w. i. pipe at Portsmouth & Phila. Navy Yards	Samuel McGowan, Pay.-Genl.
N. Y.	Brooklyn	10 a.m., Feb. 15	Pumps, gate valves and steam traps	Navy Pay Office, N. Y. City
Wyo.	Lander	Noon, Feb. 16	Replacing 3,000 ft. of wood pipe with 10-inch main	P. B. Gilbert, Town Clerk.
Wash.	Seattle	Feb. 16	Steel spillway gates for Lake Washington Canal	U. S. Engineer's Office.
D. C.	Washington	Feb. 16	Furnishing hydraulic pump	Bureau of Sup. & Accounts
Wis.	Milwaukee	10.30 a.m., Feb. 16	Furnishing 2,100 curb cocks	F. G. Simmons, Comr. Pub W.
Ida.	McCammon	Feb. 22	Waterworks construction, including 4,700 ft. 4 to 8-in. pipe, wells, etc., to cost \$22,000	Cotton & Wilson, Engrs., Idaho Falls
Cuba	Havana	Feb. 22	Constructing water supply system for Pogolotti; estimated cost \$40,000	Francisco Garcia, Ch. Engr., 24 Cuba St.

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ill.	Springfield	10 a.m., Feb. 23	Pump house and well and pump equipment at State Hospital	M. C. Schwab, Contr. Engr., 1514 Mallers Bldg., Chicago.
D. C.	Washington	Feb. 23	Bronze and malleable iron castings	General Purchasing Officer, Panama Canal.
Ind.	Bloomington	2 p.m., Feb. 24	Constructing intake, clear water well, 17,500 ft. pipe line and building power and pumping plant	Dr. C. E. Harris, Secy. Leonard Springs Water Co.
O.	East View	Noon Feb. 24	Constructing water mains in two streets	F. A. Pease Engineering Co., Marshall Bldg., Cleveland.
N. Y.	New York	11 a.m., Feb. 24	Lining part of Catskill aqueduct tunnel with brick	Board of Water Supply.
O.	Attica	noon, Feb. 24	Filtration plant and pipe line	F. R. Stulzman, City Clerk.
Ind.	Ligonier	Feb. 24	400 water meters	R. E. Nament, City Clerk.
Wash.	Colville	Mar. 1	Const. 3 miles 10 & 12-in. pipe & concrete reservoir & dam; cost, \$20,000	City Clerk.
D. C.	Washington	2 p.m., Mar. 2	Constructing cover for reservoir	Chief Clerk, Engineer Dept., District Bldg.
La.	New Orleans	Noon, Mar. 22	Constructing addition to pumping station	G. G. Earl, Gen. Supt. Water & Sewer Bd.
Ala.	Cullman	Apr. 1	Laying 2 miles of 6-in. water mains; cost \$12,000	A. G. Coe, City Clerk.
MISCELLANEOUS				
Minn.	St. Paul	10.30 a.m., Feb. 14	Fountain supplies and two motor driven lawn mowers for park	A. Hohenstein, Pur. Agt.
N. Y.	New York	noon, Feb. 14	2,500 galvanized iron ash cans, 5,000 scraper handles and 5,000 push broom handles, also malleable iron T castings and clamps for street cleaning department	J. T. Fetherston, Comr. City Clerk.
Ida.	Boise	2 p.m., Feb. 15	Sprinkling for five years	City Clerk.
Wash.	Seattle	Feb. 15	Furnishing material for 300-ft. span highway bridge in Alaska	Alaska Road Commission, U. S. Engineer's Office.
O.	Ashland	Noon Feb. 18	Collecting and disposing of garbage for one year	W. A. Mason, Mayor.
Ore.	Portland	11 a.m., Feb. 21	Furnishing building stone at mouth of Nehalem River	U. S. Engineer Office.
O.	Columbus	Noon, Feb. 21	Two one-ton motor trucks	G. A. Borden, Pres. Bd. & Pur.
Cal.	Fresno	Feb. 21	Disposing of garbage for 20 years	W. H. Ryan, City Clerk.
Ida.	Greenfield	4 p.m., Feb. 21	Cement, sand, gravel and reinforcing steel for 1916	M. A. Gettis, County Auditor.
Ida.	Greenfield	4 p.m., Feb. 21	Furnishing cement, gravel, sand and steel for 1916	M. A. Gettis, Co. Aud.
D. C.	Washington	Feb. 23	Panama Canal Supplies	Gen. Purchasing Officer, Panama Canal.
N. Y.	Batavia	3 p.m., Feb. 24	Constructing U. S. postoffice	J. A. Wetmore, Supv. Architect, Washington, D. C.
N. Y.	Albany	Noon, Feb. 24	Constructing dikes, walls and culverts along barge canal near Olean	W. W. Watherspoon, Com. P. Wks.
Alaska	Ketchikan	Mar. 1	Furnishing 300 bbls. Portland cement	Light House Inspector.
N. J.	Plainfield	8 p.m., Mar. 6	Furnishing 2,000 tons crushed stone and screenings; also crosswalks and curbing	J. T. MacMurray, City Clerk.
D. C.	Washington	Mar. 13	Constructing postoffice at Oklahoma, Okla.	J. A. Wetmore, Supv. Archt.

## STREETS AND ROADS

**East Sacramento, Cal.**—Frank Driver and Louis Kozminsky, property owners on outer J St. Road, Jan. 26 called on Commissioner of Streets M. J. Burke and requested that when J St. is called up for improvement east of 31st, entire street be paved from 31st St. to east levee. Other owners beyond golf links have made similar requests of Burke. The J St. improvement was planned to extend to Yardley Ave. East of this point the Wright & Kimbrough Co. control a very large frontage and had contemplated doing work by private contract. In order to carry on improvement under private contract all owners must sign for work. Further steps toward improvement of J St. are delayed, awaiting an agreement between East Sacramento Improvement Club and the Pacific Gas & Electric Co. over character of rails and double track.

**Lincoln, Cal.**—City trustees of Lincoln, Placer county, will call a bond election at which people will be asked to vote \$20,000 to pave main street for a distance of a mile and a half, connecting up two units of state highway.

**Los Angeles, Cal.**—Resolution adopted authorizing Board of Public Works to advertise for bids and award and enter into necessary contract for furnishing of street sprinkling equipment.

**Los Angeles, Cal.**—Council has adopted ordinance for paving on Bunker Hill Ave.

**Pasadena, Cal.**—Bids were opened Jan. 25 for curbing and guttering of Palmetto Drive and two bids have been referred to Commissioner Allin to decide which is the "lowest and best bid." He cannot very well pick one as lowest, and so he will have to define which is "best" bid. The two bidders who tied for the contract are J. E. Haddock and Raldo Shirar. Each offered to do curbing for 23c. a lineal foot, and guttering for 14c. a square foot. The third bidder was T. C. Breitenstein, whose bid was 26c.

**Redwood City, Cal.**—City contemplates paving of several streets and work will be started as soon as necessary legal steps have been taken.

**Sacramento, Cal.**—Because there were no bidders present, sale of \$1,500,000 worth of state highway bonds—last of the \$18,000,000 issue—was postponed Jan.

26 until Feb. 8. Sale was to have been held in state treasurer's office at Capitol. Many counties in state desire to take these bonds, but commission decided to sell at public auction because money will be used in scattered places throughout state in erecting small bridge structures and in completing highway links.

**Sacramento, Cal.**—Just as soon as weather will permit the State Highway Commission will begin surveys in northeastern part of State connecting isolated mountain counties with main trunk lines down Sacramento Valley, according to letter written by State Highway Engineer A. B. Fletcher to Dr. E. F. Auble of Alturas, Modoc county, member of Five Counties Association, which includes Modoc, Lassen, Shasta, Siskiyou and Trinity. Construction will begin just as soon as more money is available.

**San Diego, Cal.**—At conference meeting on bridge and road bonding proposition held Jan. 28 in Board of Supervisors' office at court house, resolution was adopted recommending to main conference meeting that steps be taken to call bond election and to create county highway commission to manage and direct expenditure of fund secured from sale of the bonds and operations in building of permanent bridges and roads.

**Santa Clara, Cal.**—Premium of \$2,000 offered by state of California for privilege of buying \$45,000 bonds recently voted here for street improvements was accepted by town trustees at meeting held here Jan. 24.

**Santa Ana, Cal.**—Petition for oil and gravel surfacing of Orchard St. from Ross to Parton was granted Jan. 25.

**Bridgeport, Conn.**—It is expected that Board of Aldermen will adopt report of Special Advisory board, now prepared by chairman of that board. Report will recommend bonding city for improvements during ensuing fiscal year to extent of \$2,000,000 and perhaps more. Items tentatively and semi-finally considered at special meeting were as follows: Schools, \$500,000; streets, \$500,000; sewers, \$500,000; park development, \$260,000; street extensions, \$250,000; land damages, \$250,000; Charities and Health department building, \$100,000; Fire and Police department buildings, \$100,000.

**Bridgeport, Conn.**—See "miscellaneous."

**Wilmington, Del.**—The court voted a \$10,000 bond issue for good roads, \$15,000 worth of bonds having been issued last year out of the \$25,000 authorized.

**Tallahassee, Fla.**—Recent bond issue of \$4,000, voted to pave College Ave., was sold at city council meeting Jan. 27 to George W. Saxon, president Capital City bank. Price given was par and accrued interest.

**Atlanta, Ga.**—County of Fullerton contemplates paving of several streets.

**Idaho Falls, Ida.**—City council, in special session, introduced ordinances creating improvement district No. 5 and providing for paving with bitulithic or concrete.

**Orofino, Ida.**—Village board has taken final action in matter of paving 4 blocks of principal business streets. Pavement and sidewalks to be concrete and will cost \$12,000.

**Alton, Ill.**—After public hearing Feb. 1 board of local improvements decided that the improvement of East Broadway by paving should be 30 ft. wide and should extend 3,036 ft. from the old city limits of Alton to the new city limits on Broadway. The paving will be constructed without inch sand cushion and along most modern lines. Ordinance calling for paving of this street will be drawn up and presented to city council at their next regular meeting.

**Freeport, Ill.**—Meeting of board of supervisors will be held Feb. 8 to call election to vote on bond issue of \$850,000 for road improvement.

**Freeport, Ill.**—Plans for boulevard system at west end of Lincoln Ave., extending from Sasby to Glove Aves., were discussed Feb. 1 at public meeting at city hall between property owners and board of local improvements. Plans were prepared by City Engineer Hepner for approval by property owners. The stretch proposed to be boulevardized is a quarter of a mile in length.

**Ottawa, Ill.**—Council meeting will be held shortly to discuss plans for repairing of business section.

**Pekin, Ill.**—At meeting of city council Dec. 31 the McLean-Prince St. paving ordinance was passed by council and ordinance for paving of the Summer-Bacon St. district was introduced. After Summer-Bacon ordinance had been read it was, on motion of Commissioner Neef,

laid over for 30 days. Ordinance provides for the paving of Bacon, Prince, Charles, Summer, Winter, Walnut and McLean Sts., and part of Park Ave. Winter, Park Ave., Walnut and McLean St. will be 30 ft. wide. Prince and Charles Sts. and Bacon St. from McLean to Derby, will be 28 ft. wide. Summer St. from Washington to McLean, will be only 27 ft. wide. The specifications call for sandstone curb. The estimated cost is \$73,161.95, divided as follows: Paving the district, \$55,323.97; 14,309.4 cu. yds. of excavating at 35c., \$5,008.29; 14,279 lin. ft. sandstone curb, \$7,853.45; 6,025 lin. ft. curb reset, \$602.50; 775 lin. ft. concrete protection curb, \$232.50; court costs, etc., \$4,141.24.

**Quincy, Ill.**—Meeting was held in office of County Superintendent of Highways L. L. Boyer in court house Jan. 29 at which time plans were made for improvement of the bottom road from Cedar St. to the Richardson oil tanks, north of city. It was decided to improve road temporarily as well as possible. It was decided also to buy a rock crusher next summer and then improve road permanently.

**Fairmount, Ind.**—Prospects are good for construction of a mile of tarvia road on West Eighth St., which is expected to make connecting link between a similar road which ends one mile west of this city, and brick pavement of Main St. Petition for the improvement of this stretch of road has already been filed with county commissioners and at council meeting Feb. 1 town waived all objections to completion of work on that part of thoroughfare which lies within the corporation limits.

**Fort Wayne, Ind.**—City contemplates expenditure of \$25,000 for paving.

**Indianapolis, Ind.**—Board has ordered resurfacing to be done on several streets.

**Indianapolis, Ind.**—Resolutions providing for paving of several streets and alleys were approved Jan. 31 by board of public works. Resolutions provided for paving as follows: First alley east of Delaware St. from 25th St. to Fall Creek Blvd.; 42d St. from Central Ave. to College Ave.; the first alley east of Pennsylvania St. from 23d St. to Fall Creek Blvd.; the first alley east of Arsenal Ave. from Sturm Ave. to Michigan St.; the first alley west of Delaware St. from 22d St. to Fall Creek Blvd.; the first alley east of Delaware St. from 23d St. to 23d St. and Cornelius Ave. from 38th St. to 40th St.

**Indianapolis, Ind.**—Bids received by board of public works Feb. 4 for oil to be used in oiling unimproved streets indicated that city will be required to pay about 100 per cent. more for road oil than last year. Despite increased cost of this method of oiling unimproved highways, however, Mayor Bell declared that city will not go back to old water sprinkling method during his administration. Indian Refining Co. received the contract for supplying the city with oil during 1915, the price being \$2.74 for each 100 gallons. The bids received by the board for 1916 on the 100-gallon basis follow: A. F. Zeigler, \$5.55; the Great Western Oil Co., \$5.56; Standard Oil Co., \$4.85; Indian Refining Co., \$4.99, and Barber Asphalt Co., \$6.30. Board referred bids to City Engineer Jeup for investigation. Samples of oil submitted with each bid will be analyzed. Specifications called for bids on oil containing 40 per cent. asphalt with understanding that city is to buy at least 750,000 gallons.

**Kokomo, Ind.**—Commissioners may call election to vote on material to be used in paving C. M. Rickett's Rd. The proposed improvement leads from Rickett's Pike to the Hanna Rd. and with a spur to Park Blvd. It is proposed to pave this with asphaltic concrete at estimated cost of \$37,855.40.

**La Porte, Ind.**—Property owners on Indiana Ave. are discussing plans for paving of that street with asphalt.

**La Porte, Ind.**—Sheet asphalt is to be used as paving material on both Indiana and Michigan Aves., Indiana Ave. property owners to number of 47 petitioned for sheet asphalt and resolution as passed by board of works Jan. 22 will therefore be rescinded as to kind of pavement. Indiana Ave. asks for Trinidad asphalt which settles it on that street, but there is a possibility of some other brand being selected for Michigan. However, it will be sheet asphalt on a 6-inch concrete foundation. Western Construction Co. of Mishawaka, is lowest bidder on Trinidad Lake asphalt. If some other brand of lake asphalt is selected on Michigan Ave. Conway Co., or David

& Hutchins may get contract. Should Trinidad be picked Western Co. will lay both streets.

**Forest City, Ia.**—Resolution has been introduced by town council providing for construction of about 40,000 yds. of street paving and 20,000 ft. of curbing. Various types of pavement are under consideration. Further action will be taken Feb. 18. G. B. Chryst is town clerk and Theo. S. DeLay, Creston, Ia., is town engineer.

**Tipton, Ind.**—County Treasurer Hasket sold road bonds amounting to \$7,760 to the Citizens' National Bank of this city at par and \$160.50 premium. The same bank bought other gravel road bonds amounting to \$3,160 at par and \$58.58 premium. The Farmers' Loan & Trust Co. bought Crail road bonds in the amount of \$1,800 for par and \$26.10 premium. There were four bidders, J. F. Wild & Co., and Breed, Elliott & Harrison of Indianapolis, competing with the local banking firms.

**Williamsport, Ind.**—The Fletcher American National Bank, of Indianapolis, bought Warren county gravel road bonds to amount of \$38,640, paying a premium of \$835.60, and J. F. Wild & Co. of Indianapolis bought gravel road bonds to amount of \$28,180, paying a premium of \$617.25.

**Council Bluffs, Ia.**—City Council will order repaving to be done on Pearl St. at estimated cost of \$14,725.

**Sac City, Ia.**—City council has instructed city solicitor to draw up resolution of necessity for paving about 3½ miles of streets. Action will be taken upon resolution first meeting in February.

**West Liberty, Ia.**—City council in special session Jan. 31 acted favorably on proposition to pave almost 60 blocks during coming summer.

**Newton, Kan.**—Ordinances were passed by city commission Feb. 1 at regular session, covering necessary legal steps for issuance of remainder of the paving bonds, on work completed and accepted. These bonds will be in two issues, one set covering work on Main St., both north and south, and amounts to \$29,300. Other issue calls for \$88,000 in bonds and covers work on Sixth, Broadway, Seventh, Ninth, South Second, Oak, Poplar, Ash, Plum, Pine, Walnut Sts.

**Topeka, Kans.**—Proposal to build a rock road to connect Topeka and Kansas City will be submitted to motor car owners and dealers of Kansas City and Lawrence shortly by Topeka Automobile Club and Topeka Commercial Club.

**Bowling Green, Ky.**—Warren County Fiscal Court has voted to ask for \$15,000 for state aid for building roads.

**Elkton, Ky.**—By a vote of 4 to 2 Magistrates Bronaugh, of Trenton, and Thornsberry, of Sharon Grove, opposing resolution, Todd Fiscal Court Feb. 1 decided to expend funds available from State aid and county sources amounting to between \$14,000 and \$16,000 on public road leading from Elkton to Greenville.

**Louisville, Ky.**—Petition has been filed in office of County Auditor George W. Stoner asking board of county commissioners to order improvement of highway in Wood township, length of proposed road being less than three miles. Action will be taken March 6.

**Lexington, Ky.**—Commissioners have petitioned for improvement of Euclid Ave.

**Paducah, Ky.**—City contemplates construction of permanent roads.

**Baltimore, Md.**—Following contracts were received Feb. 2 for paving: Contract No. 126—American Paving Co., \$1.05; P. Flanagan & Sons, \$1.36; Barber Asphalt Co., \$1.58; Baltimore Asphalt Block and Tile Co., \$1.66; Consolidated Engineering Co., \$1.38; Union Paving Co., \$1.51. Contract No. 127—American Paving Co., \$1.20; P. Flanagan & Sons, \$1.40; Barber Asphalt Co., \$1.66; Baltimore Asphalt Block & Tile Co., \$1.66; Consolidated Engineering Co., \$1.42; P. Reddington, \$1.66. Contract No. 128—American Paving Co., \$1.62; P. Flanagan & Sons, \$1.55; Barber Asphalt Co., \$1.69; Baltimore Asphalt Block & Tile Co., \$1.69, and Consolidated Engineering Co., \$1.42. Contract No. 129—American Paving Co., \$1.20; P. Flanagan & Sons, \$1.40; Barber Asphalt Co., \$1.64; Baltimore Asphalt Block & Tile Co., \$1.47; Union Paving Co., \$1.48; P. Reddington & Sons, \$1.49, and Consolidated Engineering Co., \$1.35.

**Athol, Mass.**—A largely attended meeting of citizens of Athol, Dana, New Salem, Petersham and other towns was held in district court room Feb. 4. Purpose of the gathering was to discuss matter

of proposed gravel or improved road to Springfield by way of Athol, South Athol, Dana and Enfield. It was voted on motion of J. C. Hill, that boards of selectmen of different interested towns be general committee to go to Boston to present matter to commissioners, different boards to have power to appoint associates from citizens of town.

**Springfield, Mass.**—Appropriation of \$5,000 will be asked for constructing permanent road of stone or gravel from North Main St. to Whately line.

**Springfield, Mass.**—Town will be asked to appropriate \$5,000 for purpose of extending macadam road toward North Hadley.

**Swampscott, Mass.**—Plans are being discussed for improvement of Essex St. at cost of about \$20,000.

**Taunton, Mass.**—Further appropriation of \$15,000 for continuance of work of constructing state highway from town of Norton to city of Taunton, was advocated before legislative committee on roads and bridges Feb. 2 by Rep. Higgins of Taunton and Worrall of Attleboro and by Dr. Rounds of Norton. An appropriation of \$12,000 was made last year by legislature for the work with understanding that further appropriations would be made from time to time until highway was completed. Total cost of completing the highway is estimated at \$75,000.

**Ware, Mass.**—Question of the building of the state road between Ware and Enfield will be brought before voters, but it remains to be seen whether they will wish to appropriate any money to assist highway commission in work.

**West Newbury, Mass.**—Town meeting will be held March 6th, when following articles will be voted on: Article to see if town will purchase stone crusher and appropriate sum of money for same; to see if town will make permanent improvements on Church St., providing the state highway commission will assist in work. An article for permanent improvement on Prospect St., each calling for \$1,000 appropriation. An article to instruct selection to petition county commissioners to repair highway from intersection of Garden and Middle Sts. to the junction of King and Middle Sts., to see if town will insure all men working in the highways; to see if town will accept the offer of Newburyport Gas & Electric Co. to light certain streets or to take any action the town desires in matter of street lighting and appropriate money for the same; to see if the town will vote to install electric lights in its public buildings and appropriate money for the same.

**Detroit, Mich.**—Repaving in 49 streets is provided for in department of public works budget for 1916-17, filed in the controller's office Dec. 31. Commissioner Fenkell has asked total appropriation of \$944,275 to cover cost of repairs and contemplated repaving in 1916. Twenty-three asphalt, one brick, 17 creosote block and eight stone-covered thoroughfares are recommended for repaving. Commissioner Fenkell asks \$392,510 to lay new asphalt, \$324,915 for creosote block, \$104,190 for brick, \$89,660 for stone, \$30,000 for cedar and \$3,000 for concrete. The total appropriation asked for the department of public works this year is \$4,884,691.80, which is \$10,696.77 more than board of estimates allowed last year. With street car extensions apparently near, Commissioner Fenkell has asked \$138,910 to cover cost of foundations for proposed extensions. He also asks \$150,000 to replace old foundations. In accord with suggestion in annual message of Mayor Marx, commissioner has included in his budget request for \$75,000 with which to build a creosote block plant preparatory to city laying its wood block pavements.

**Flint, Mich.**—Bids for only five pavements out of 32 which are to be built this year were received by street committee of common council and as a result recommendation was made Dec. 31 that all work be done under direction of city engineer. Report of street committee was adopted unanimously. There are to be \$270,000 worth of pavements constructed this year. On the five pavements on which bids were received contractor failed to get within estimate made by City Engineer Shoecraft, it is said.

**Brookhaven, Miss.**—Outside capitalists have been here making preliminary arrangements to take over bond issue of Lincoln county to be awarded at February meeting of Board of Supervisors for building good roads over entire county. Road commissioners of county estimate that it will take an issue of approximately \$110,000 to \$150,000 according to contracts that are let out to build them. One

of the plans is to have roads graded by county's convicts, in which case, with assistance of a large motor truck for purpose of distributing gravel, the cost will not go over smaller sum. Latter plan seems to be favored and will most likely be adopted, sentiment being universal for the roads to be built as soon as possible.

**Edwards, Miss.**—At special election for road impt. bonds for road dist. of Hinds Co., voters authorized supervisors to order bond issue of \$30,000 to assure construction of good gravel roads in district, and will add to Vicksburg-Jackson highway another lap from Big Black river, on west, through town of Edwards and to a point two miles east, or a total length of about eight miles.

**Kansas City, Mo.**—Plans are being drawn for boulevard to follow Chelsea car line from Seventh St. on Kansas side along Jersey creek to 18th St. Boulevard will be on ground used by car line and will pass under 10th St. at Heathwood Park.

**Garfield, N. J.**—Borough of Garfield will appeal to Supreme Court to have commissioners appointed to condemn necessary property to widen and straighten lines of DeWitt St. This action was decided upon at meeting of borough council as a committee Feb. 1. Borough Attorney Joseph H. Lefferts will prepare necessary papers immediately.

**Hillside, N. J.**—Petition bearing signatures of majority of property owners in Broadway, West Newark section, has been received, requesting that this thoroughfare be improved by 1,380 ft. of sidewalk between Long Ave. and Silver St. This was referred to road committee.

**New Brunswick, N. J.**—Plans were submitted at meeting of the Board of Freeholders Jan. 31 by County Engineer A. B. Fox for improvement of "Hole-in-the-Wall" at South Amboy. Clerk, Asher Bissett, was instructed to communicate with C. S. Krick, acting superintendent of the Trenton division of the Pennsylvania Railroad, for purpose of arranging a conference. Roadway is now ten feet wide with a 4-ft. sidewalk on one side. Height is 14 ft. and in the center there is a turnout for vehicles. On the South Amboy side there is a hill, down which the rain water rushes and floods roadway. Plan provides for 50-ft. width under railroad, with sidewalk 10 ft. wide on each side. Railroad tracks would not be raised, but pipes would be laid to carry off the surface water.

**New Brunswick, N. J.**—At meeting of board of freeholders Feb. 3 a resolution was adopted rescinding award of contract for resurfacing first section of Cranbury turnpike to Thomas H. Riddle of this city, and also rescinding contract given to Liddle & Pfeiffer of Perth Amboy, for resurfacing second section of the same turnpike. Following adoption of new plans by county engineer work of improving this highway will be again advertised and county is expected to save considerable money in the matter.

**Newark, N. J.**—Arcadia town board met Feb. 1 at the Newark village hall. Means of connecting old Allerton road, which now ends at Emery Van Hoesen place, with bridge crossing Barge Canal from the Edgett Burnham property, were discussed, but no definite plans were made.

**Newark, N. J.**—Resolution has been approved by mayor for paving to be done on 9 streets.

**Paterson, N. J.**—City will make many improvements on several streets shortly by paving, guttering, construction of sewers, etc.

**Antwerp, N. Y.**—Special election will be held Feb. 11 to vote on bond issue of \$10,000 to be used for paving for Main St.

**Binghamton, N. Y.**—Movement has been started to improve Tompkins St. with macadam highway or pavement from Tompkins St. bridge to Conklin Ave.

**Brooklyn, N. Y.**—Bridge Commissioner Kracke's plans for repaving roadway of Queensboro Bridge, the condition of which has brought strong protest from automobilists, have been approved by Mayor Mitchell. In a letter sent Controller Prendergast, made public Jan. 31 Mayor expresses desire that Corporate Stock Committee of Board of Estimate report favorably upon the appropriation of \$144,000 asked for this purpose by Bridge Commissioner.

**Herkimer, N. Y.**—Bids were received Feb. 1 for construction of 9.05 miles of improved road at office of William H. Corey, county engineer, by A. S. Seamans, county purchasing agent, and Timothy J. O'Brien, clerk of the board of supervisors. Bids will be considered at a special session of the board of super-

visors Feb. 10, it is expected, and bids will probably be let at that time. Following bids were offered: Road No. 11, commencing on county highway No. 459, thence northerly over Carden Lane to Schuyler's Bush, 2.28 miles in town of Schuyler; Rock & Griffin, Masena, \$12,605; Frank Gallo, Herkimer, \$12,103.50; Phelan & Sullivan, Utica, \$9,571.50; Chas. O. McComb, Syracuse, \$9,756.90. Road No. 18, Cedarville-Van Hornesville, section 2, distance 4.9 miles in town of Warren; C. R. Snell & Co., Canajoharie, \$25,425; Crim & Gay, Jordanville, \$23,647; Atlanta Construction Co., Atlanta, N. Y., \$25,164. Road No. 26, West Schuyler-Onelida County line, distance 1.93 miles in town of Schuyler: Frank Gallo, Herkimer, \$12,462; Phelan & Sullivan, Utica, \$9,987.50; Rock & Griffin, Masena, \$14,248.50; C. O. McComb, Syracuse, \$9,617.80. Road No. 27, Joselyn Hill, distance 2.29 miles. No bids offered.

**Norwich, N. Y.**—Seventy-seven thousand dollars will be spent by towns of Chenango county for maintenance and improvement of their dirt roads during coming season, according to figures which were shown at meeting of town superintendents of highways, supervisors and members of town boards at court house in this city Feb. 4.

**Rome, N. Y.**—Onelida county highway funding bonds to amount of \$100,000, bearing 4½ per cent. payable semi-annually, were sold Feb. 2 by County Comptroller J. H. Carroll at the county building in Utica, to Utica Trust & Deposit Co. Of 22 bidders that company offered highest premium, its figures being \$2,750.

**Schenectady, N. Y.**—Elimination of Jefferson St. bridge over Erie canal is proposed by City Engineer W. Thomas Woolley and filling in of old Erie canal bed at that point for highway purposes proposed as a substitute. Plans are now being drawn for proposed changes and will soon be submitted to General W. W. Witherspoon, state superintendent of public works, for his approval.

**Utica, N. Y.**—Election will be held April 4 to vote on bond issue of \$50,000 to pay for city's share of paving of streets.

**Ellisburgh City, N. C.**—Pasquotank highway commission held its regular meeting Feb. 1. The plan for making a gravel road of about 250 yds. from Norfolk Southern railroad track at the north end of Road St. to point running north to next track was discussed.

**Wilmington, N. C.**—Engineer will be appointed to determine best route for highway between Fayetteville and this city, which is being planned.

**Fargo, N. D.**—Already there are petitions in for paving of 90,000 yds., estimated cost being figured by city engineer at \$300,000, which is divided up into 11 contracts. It is reported that there are also a number of petitions still to be brought in that will increase total considerably. In addition to paving there is large amount of water and sewer extension to be done and it is expected that a new trunk sewer will be constructed to relieve congested sewer conditions in that portion of south side of city lying between Eighth and 13th Sts., and Front St. and Fourth Ave. South.

**Cincinnati, O.**—Council has ordered sale of bonds in sum of \$280,000 for purpose of providing funds to pay cost and expense of improving and repairing existing streets, also repairing viaducts, bridges and culverts.

**Columbus, O.**—Council indicated it will put to popular vote question of settling issuance of bonds for numerous details which have been projected. Among these are: North High St. widening, \$75,000; purchasing of additional ground for Lincoln Park, \$1,500. Another issue of \$200,000 will be asked to use in paying the city's proportion of 1916 street improvements. Unless this issue is authorized, little or no street improvement or extension work will be done this year. There also probably will be requested authority to issue \$100,000 bonds to insure continuation of garbage and refuse collection.

**Fremont, O.**—Residents of E. State St. who decided to hold up paving of that street unless L. S. E. Ry. Co. would accede to demands for double track, Feb. 1 decided to petition council for paving of street after meeting with General Manager Coen of railway company, at which both sides made concessions.

**Hamilton, O.**—Council is discussing plans for paving of several streets.

**Urbana, O.**—See "Sewerage."

**Roseburg, Ore.**—State highway commission has been requested by county

court to appropriate funds for paving Edenbower Road.

**Salem, Ore.**—State highway commission has been requested by the Pine Grove Grange, Hood River County, to set aside \$50,000 to maintain the Columbia highway around Mitchell Point.

**Salem, Ore.**—Provided Wasco County will issue bonds to build Columbia highway from Mosier to The Dalles, highway commission will expend \$90,000 on highway from Hood River to Mosier. Such an arrangement was entered into between commission and a delegation from Wasco county Jan. 27. Should link between Hood River and Mosier cost more than \$90,000, Wasco and Hood River counties will have to provide excess balance, according to arrangement. Permission was also granted Wasco county to build its link of highway over Seven Mile hill instead of along river.

**Chester, Pa.**—Council has authorized the solicitor to draw up 12 separate petitions for improvements to as many streets.

**Chester, Pa.**—Council has passed ordinance authorizing paving on Edgmont Ave.

**Weatherly, Pa.**—Co-operation between State, Carbon county, Lehigh township, Weatherly borough and Middle Coal Field Poor district is being planned by committee for improvement of the state highway between Weatherly and White Haven, to connect with state highway between Hazleton and Wilkes-Barre.

**Wilkes-Barre, Pa.**—Council has passed an ordinance authorizing grading, curbing and paving of Westminster St., between Hanover and Thomas Sts., in the 15th Ward of city of Wilkes-Barre.

**Williamport, Pa.**—Plans are being made by Councilman George K. Harris, superintendent of public improvements, to make systematic inspection of dirt streets to ascertain what thoroughfares are in greatest need of being paved. This trip will likely be made by the councilman and City Engineer J. B. Otto. One of the streets that is most likely to be paved this summer is Packer St. from Brandon Park to intersection of Market St.

**Providence, R. I.**—Petition for paving on Eutaw St. has been referred to Committee on Streets.

**West Barrington, R. I.**—At meeting of council Feb. 1 a communication was received relative to proposal of widening and erecting sidewalk at corner of Park Ave. and Washington St. in West Barrington. The matter was favorably considered and will be adjusted at another meeting.

**Erwin, Tenn.**—Unicoi county soon will vote on a road bond issue of \$100,000, recently authorized by county court.

**El Paso, Tex.**—The contract and bond of the El Paso Bitulithic company for paving Prospect Ave., providing for an indemnity of \$4,000, was approved by the city council in regular session. The new paving will extend from the north line of Upson Ave. to its intersection with the south line of West Boulevard.

**El Paso, Tex.**—James Gladding, city engineer, submitted a report to council on cost of paving South Kansas St. from improvement district No. 1 to 8th St., estimating cost at \$30,792.70. Improvement of intersections would cost \$6,535.48.

**Hereford, Tex.**—City has voted favorably on question of paving streets.

**McKinney, Tex.**—Number of citizens of East McKinney met with Mayor Finch and Commissioners Barnes and Massie in interest of having East Greenville St. paved. New paving contract will be let soon which will include paving of this street.

**Nashville, Tenn.**—It is announced that newly appointed engineer of state highway commission, A. M. Nelson, and secretary or highway board, J. J. Murray, will visit a number of counties and inspect roads to determine upon which to expend highway money. Next week Sumner, Trousdale and Macon counties will be visited.

**Paris, Texas.**—At meeting of City Council Jan. 24, the contract was awarded for paving E. Houston St. from 23rd to 25th St. Bitulithic material is to be used at a cost of \$2.30 per yard.

**San Angelo, Texas.**—Citizens of Reagan, Crane and Upton counties have announced that they will shortly have roads running east and west across their counties in excellent condition. They are asking that part of All-Southern auto highway through the counties be logged. Considerable money is being spent for road improvements.

**Temple, Tex.**—Oil is being considered

by commissioners' court of Bell county as material to preserve pikes in county.

**Parkersburg, W. Va.**—Ordinances have been introduced for paving several streets at probable cost of \$37,000.

**Centralia, Wash.**—Council has under consideration paving of 1st St. the entire length of town.

**Everett, Wash.**—Commissioners have ordered county engineer to proceed with surveys recommended by advisory board some time ago. Hearing will be held Feb. 21 on county engineer's report on Vernon Road.

**Olympia, Wash.**—Date of opening bids for grading and draining 10 miles between Ellensburg and Vantage, on Sunset Highway, will be extended until Feb. 21. Bids were to have been opened February 14.

**Portland, Wash.**—Petitions are being circulated for paving E. Glisan from E. 75th to city limits, 15 blocks.

**Seattle, Wash.**—Bids will be received until March 3 by board of public works for construction of 10th Ave.

**Spokane, Wash.**—Petition from property owners of abutting property asking that city prepare bids to pave sidewalk and curb 24th Ave. from Howard to Bernard St., a distance of 3 blocks, have been filed with Commissioner Funk. The commissioner set Feb. 17 at 1:30 p. m. for hearing of protests by Commissioner Funk and city engineer.

**Tacoma, Wash.**—State Highway Commissioner Roy has rejected specifications for asphalt and wood block paving on hilly parts of mountain road and on Pacific highway. County will probably not call for bids for sheet asphalt or wood block on other sections, which will leave bitulithic and cement as chief materials.

**Walla Walla, Wash.**—City commission plans hard surface of 5 miles of streets. Resolutions passed for 70 blocks on which hearing will be held Feb. 15. Estimated cost \$150,000.

**Grafton, W. Va.**—Preston county, which adjoins this county on east, expects to spend not less than \$1,000,000 on good roads during next two years and this is expected to put every foot of county's 112 miles of roadway into good condition. Concrete and brick will be used for roads. Portland district has already voted \$200,000 in road bonds and Kingwood district has approved a \$164,000 bond issue. Lyons district will shortly vote on a \$200,000 bond issue also. Valley, Pleasant and Grant districts are expected to follow suit within a few months and this will make the total considerably over million mark.

**Manitowoc, Wis.**—Following bids have been received for 29,000 sq. yds. asphalt and brick pavement with 5-in. and 6-in. foundation: Rasmussen Sons, Oshkosh, Wis., light Texaco at \$1.68 per sq. yd., Trinidad at \$1.69, Mexico at \$1.63. Standard, Mexico at \$1.76. Texaco at \$1.81, Trinidad at \$1.82. Murphy Const. Co., Manitowoc, Wis., at \$2.08½ for asphalt filler and at \$2.14½ for grout filler.

**Sheboygan, Wis.**—The board of public works opened bids to furnish city with street flusher. Only two bids were submitted. Sterling Motor Truck Co. of Milwaukee offered motor driven street flusher of 600 gallons capacity for \$3,800. E. D. Etnyre & Co., of Oregon, Ill., offered horse drawn flusher of 675 gallons for \$1,290 and a 750-gallon flusher for \$1,340. Sprinkling or oil sprinkling attachments may be attached for \$25 additional. Same company offered a motor truck combination street flusher and sprinkler. Flushers without the sprinkling attachment and possessing a capacity of 1,200 gallons, is offered for \$4,625. Sprinkling or oil attachments may be added for \$50. A guarantee of one year is given on each flusher. Appropriation is \$1,800. This is less than both bids on motor driven flushers. Bids will be referred to the council.

**Superior, Wis.**—Estimate of more than \$120,000 for work on roads of Douglas county has been prepared by Highway Commissioner Morisset for next year. This is more than available funds amount to and for this reason it is probable that all of the work will not be done within the year. Program includes work in every township in the county and completion of the roads that started during last year. In town of Superior "Military" road is to be completed at a cost of \$15,000. Bardon Ave., from Black River to town line, a distance of two miles, will be completed, costing \$3,600. Bardon Ave. will be graveled from Roth's corner to the Sloan school and the Black

River road will be graded from Dedham corner for two miles east. These two roads will cost \$10,000. In the town of Summit the Black River road and Bardon Ave. will be improved and finished at a cost of \$7,500.

#### CONTRACTS AWARDED.

**Daly City, Cal.**—To Ransome-Crummey Co., at \$31,914, for paving in Vista Grande district with asphaltic concrete.

**Hanford, Cal.**—For constructing Highway No. 3, Hanford to Guernsey, to O. D. Johns, San Francisco, at \$26,257.21. Will require 7,500 cu. yds. excavation, 680,667 sq. ft., 1½-in. Topeka surface, 220 ft. standard guard fence.

**Los Angeles, Cal.**—To Geo. H. Oswald, O. T. Johnson Building, at \$22,493, for asphalt paving on Shearer St., about 138,243 sq. ft., and to Walter Overall at \$11,537, for paving on Westmoreland Ave.

**Ontario, Cal.**—For 469,657 sq. ft. of concrete base, 37,649 sq. ft. concrete gutter, 2,075 cu. ft. concrete in culverts and 103,088 sq. ft. grading on A and Bon View Sts. and Euclid Ave. to Ford & Stout, Bradbury Building, Los Angeles, at \$45,231.

**Manchester, Conn.**—To W. F. Potter, North Haven, Conn., at \$29,000, for walk and curb work. J. Frank Bowen is City Engineer.

**Elgin, Ill.**—To Logan & Giertz Construction Co., Elgin, Ill., at \$35,927.04, for paving on Center St. Other bidders were as follows: Western Improvement Co., Racine, Wis., at \$34,783.47 (Mexican). Commonwealth Improvement Co., Chicago, Ill., at \$35,480.93 (Aztec or Stanolind). McCarthy Improvement Co., Davenport, Ia., at \$36,187.95 (Mexican). Western Improvement Co., at \$36,180.91 (Trinidad). McCarthy Imp. Co., at \$37,409.81 (Trinidad). Western Imp. Co., at \$37,054.31 (Sarco). David Hodson Const. Co., Gary, Ind., at \$37,091.55 (Texaco). H. G. Goelitz, Oak Park, Ill., at \$37,270.45 (Texaco or Mexican). H. G. Goelitz, Oak Park, Ill., at \$38,842.57 (Trinidad). F. P. Caughlin Co., Chicago, Ill., at \$40,543.49 (Trinidad). White Const. Co., Chicago, Ill., at \$40,980.19 (Trinidad). Standard Paving Co., Chicago, Ill., at \$41,202.21 (Trinidad). The bid of Logan & Giertz Const. Co. was the same for Sarco, Mexican or Stanolind pavement. Engineer's estimate was \$42,202.95.

**Elgin, Ill.**—To Logan & Giertz Const. Co., Elgin, Ill., for paving on Porter Ave. with Sarco, Mexican or Stanolind at \$17,127.20. Other bidders were as follows: Western Imp. Co., Racine, Wis., at \$16,215.86 (Mexican). Commonwealth Imp. Co., Chicago, Ill., at \$16,852.50 (Aztec or Stanolind). McCarthy Imp. Co., Davenport, Ia., at \$16,858 (Mexican). Western Imp. Co., at \$17,015.38 (Trinidad). H. G. Goelitz, Oak Park, Ill., at \$17,218.45 (Texaco or Mexican). Western Imp. Co., at \$17,515.08 (Sarco). McCarthy Imp. Co., at \$17,557.58 (Trinidad). David Hodson Const. Co., Gary, Ind., at \$17,595.70 (Texaco). H. G. Goelitz, at \$18,117.91 (Trinidad). F. P. Caughlin Co., Chicago, Ill., at \$18,982.57 (Trinidad). White Const. Co., Chicago, Ill., at \$19,339.12 (Trinidad). Standard Paving Co., Chicago, Ill., at \$19,449.03 (Trinidad). Engineer's estimate was \$20,038.70.

**Galesburg, Ill.**—Contractor J. B. McAuley of this city was awarded the Pine St. paving contract by the board of local improvements at a meeting held on Friday afternoon at 4 o'clock in the city hall. There were seven bidders for the job and the bids varied about only \$700. Mr. McAuley was the lowest bidder, at \$19,992.25. Other bidders were: Gund-Graham Co., by G. W. Graham, Freeport, Ill., \$20,575.35; I. D. Lain, Bloomington, Ill., \$20,509.50; Jansen & Zoeller, Pekin, Ill., \$20,445; Beardstown Concrete Construction Co., by James D. McCarthy, Beardstown, Ill., \$20,420.75; Pronger & Fletcher, Blue Island, Ill., \$20,202.50.

**Larned, Kan.**—For 31,000 sq. yds. vert. fib. brick pavement with 4-5-inch concrete foundation, 9,892 sq. yds. excavation, and for storm sewer to McCoy & Taylor, of Kansas City, Mo., and Larned, Kan.

**Boston, Mass.**—To Charles J. Jacobs Co. at \$1,210.00, for repairing artificial stone sidewalks. Other bidders were: Wm. J. Rafferty & Co., \$1,395; Jere J. Sullivan, \$1,435; John Landis, \$1,450; Martino De Matteo, \$2,440; Warren Bros. Co., \$3,215.

**Blwabik, Minn.**—Village council, after hearing a representative of Chicago Aus-

tin-Weston Road Machinery Co. in regard to village buying an oil street sprinkler decided to buy one for \$600.

**Crookston, Minn.**—For constructing about 9 miles of road and ditch, to Harold Arpin, Grand Rapids, Wis., at about \$37,000.

**Newark, N. J.**—For furnishing city with flagging during year to Newark Blue Stone Co., at \$7,095. Morris R. Sher-rad is City Engr.

**Cincinnati, O.**—By board of control for laying cement sidewalks in Districts Nos. 1 to 3, inclusive, to Charles Kuhl Artificial Stone Co., Cincinnati, at a total of \$17,641; to Billing Artificial Stone Co., Cincinnati, for District No. 4, at \$5,750. Frank S. Krug is City Engr.

**Youngstown, O.**—For Court St. paving to M. F. Clark, at \$2,967. For Elberon St. grading to M. F. Clark at \$369. For Hazelwood Ave. grading to Wilson, Tiberio & Robinson at \$4,986.50.

**Pittsburgh, Pa.**—For grading site for new high school academy at 26th and State St. to J. & M. Doyle, at \$16,443.

**Charleston, S. C.**—To Simons-Mayrant Co., at \$25,000, for constructing ways and roadway at Charleston Navy Yard.

**Maynardville, Tenn.**—To Frank Maloney, Knoxville, Tenn., at \$82,000, for constructing roads.

**Dallas, Tex.**—By city commissioners for paving Bishop Ave. between Zang's Blvd. and Sixth St. to Levy & Levy on their bid of \$32,249.80. Asphaltic concrete will be used.

**Denison, Tex.**—For improving highway system by County Commissioners at Sherman as follows: Wamack Construction Co., Terrell, \$453,000; W. P. McCoy, Arlington, \$83,000, and J. W. Hoffman & Co., Muskogee, Okla., \$80,000. Gravel purchased from J. W. Hoffman & Co. at 21½ cts. per ton f.o.b. pits; approximately 250,000 yd. gravel will be used. Julian C. Field & Co., Denison are Consulting Engineers, 105 Field Bldg.

**Giddings, Tex.**—By Commissioners Court awarded for constructing roads in Lee County to Smith Bros. of Crockett, at \$30,000.

**Charleston, W. Va.**—For paving with asphaltic concrete on portions of Kanawha, Hale and other streets awarded as follows: 22,118 sq. yds. to R. M. Hudson, Charleston, at \$45,624; 6,554 sq. yds. Central Engineering Co., Charleston, \$12,908; 5,885 sq. yds. Casey Reed Co., Lexington, Ky., \$13,616. J. M. Clark is City Engr.

**Tacoma, Wash.**—State highway commission awarded contract for clearing and grading between Easton and Cle Elum on Sunset highway, Kittitas county, 13 miles to General Construction Co., Spokane, \$29,564.50.

#### SEWERAGE

**Los Angeles, Cal.**—Council has ordered construction of sewers in Newland St., Baxter St., Ave. 43 and Alexandria Ave.

**Los Angeles, Cal.**—Council has ordered construction of sewer in Bunker Hill Ave. and California St.

**Sacramento, Cal.**—Council has ordered improvements on several streets by construction of sewers.

**Bridgeport, Conn.**—See "Miscellaneous."

**Rexburg, Ida.**—Engineers Cotton and Wilson, Idaho Falls, have submitted plan to city for municipal sewer system. It is being considered by council.

**Fort Wayne, Ind.**—It is estimated by engineering department that sewer planned for east end will cost \$28,000. It will be 3,500 feet long and average 16 ft. deep.

**Lexington, Ky.**—P. H. Norcross, of Solomon-Norcross Co., of Atlanta, Ga., which has contract for designing plans and supervising construction of the \$350,000 sewage disposal plant, arrived in Lexington Feb. 1. from New York. While here Mr. Norcross will sign, in behalf of firm, contract which was approved by commissioners last Monday. Plans for plant are rapidly being formulated and bids for its construction will be called for soon.

**Lexington, Ky.**—Mayor has been authorized to advertise for bids for construction of northern main sewer from Limestone St. to Jackson St.

**Annapolis, Md.**—Engineer Hayman has been directed to advertise for bids for extension of sewer on Curtis Ave., Curtis Bay, from Hazel St. to Poplar St.

**Lowell, Mass.**—Council has voted to borrow \$40,000 for sanitary and surface draining.

**Springfield, Mass.**—City contemplates construction of sewer system in western part of town.

**Flint, Mich.**—Petitions for sewers and water mains on Edington, Greenlee and Belvedere and South Saginaw Sts., have been referred to sewer committee and water board respectively.

**Little Falls, Minn.**—Petition of majority of property owners on Broadway east between end of present sewer and west side of proposed federal building for new sewer extension past post office site was presented to council Jan. 31 and deferred. Meantime the city engineer will locate west end of present sewer.

**Lewiston, Mont.**—Security Bridge Co., local, at \$1,280 submitted low bid for construction of sewer on Bucksline flat, between boulevard and Montana St.

**Manhattan, Mont.**—City council has approved plans submitted for installation of sewer system by the Billings Engr. & Const. Co. Work to start in spring. Funds to be secured by assessment.

**Binghamton, N. H.**—Council is contemplating sale of bond issue in sum of \$150,000 for installation of municipal sewage disposal plant.

**Camden, N. J.**—City contemplates construction of sewers in several streets.

**Hillside, N. J.**—Two propositions for affording drainage and sewerage facilities for territory south of the Lehigh Valley Railroad tracks were outlined by Engineer William H. Luster last night at meeting of township committee held in the Hillside Ave. School. It was decided to hold citizens' meeting in the Saybrook School Feb. 9, night following monthly meeting of the board of health, at which time proposed plans will be discussed. To provide drainage and sewerage facilities for Hollywood Heights section alone, Mr. Luster estimated it would cost \$12,000, and to take in other portions of the southern part of the township it was figured that it would cost \$16,000.

**Newark, N. J.**—Resolution has been approved by mayor for construction of sewers in High and River Sts.

**New Brunswick, N. J.**—County engineer was instructed Feb. 3 to prepare plans and specifications for erection of a storm sewer at east approach to the South River bridge.

**North Arlington, N. J.**—Special sewer committee appointed by North Arlington Borough Council to make a survey preliminary to installation of a system to connect with Passaic Valley trunk sewer met Jan. 31 at office of John R. O'Connor, chairman of committee. A profile prepared by Engineer Robert Watson of Rutherford was submitted and will be reported on at meeting of council. It is likely that definite action will be taken at March session of council.

**Whiteville, N. J.**—Petition from property owners was presented to Neptune committee Feb. 1 asking that sewer system be extended west along Monroe Ave.

**Fairport, N. Y.**—Village Engineer C. F. Fisher has completed plans for new sewer to be laid in John St. Sewer will be more than 800 feet long and will be a part of improved system now being built through village.

**Rochester, N. Y.**—Clerk Pifer has been instructed to advertise for bids for four revolving screens for use just outside of detritus tanks at new sewage disposal plant. These screens will take up matter more than 1/4-inch in diameter.

**Rochester, N. Y.**—Bids for furnishing a grit excavator for new sewage disposal plant in Irondequoit were opened at meeting Feb. 2 of board of contract and supply. Rochester Excavating Machinery Co.'s bid of \$12,718.75 was low. Others bidding were Sanitation Corporation, \$16,500; Seneca Engineering Co., \$16,700. Bids will be gone over carefully and the contract let later.

**Greensboro, N. C.**—Bids will be received until 2:30 p. m. or later, Feb. 17th, for bond issue of \$50,000 to be used for purpose of extending and equipping existing sewerage system. For further information address T. J. Murphy, Mayor.

**High Point, N. C.**—City council is seriously contemplating building of a disposing and purification plant for city sewerage.

**Farro, N. D.**—See "Streets & Roads."  
**Hamilton, O.**—Building of storm sewers north of Crawford's Run and east of the Canal will cost about \$100,000 estimated Engineer Weaver since ten foot main line would have to be built to East Hamilton. This one line would cost \$50,000. Lateral sewers north and south, five foot large, would have to be constructed, although probably some time later.

**Lima, O.**—Approval was given Feb. 1

to sewers on Shawnee St., Bellefontaine Ave., to plant of Steel Castings Co., on Calumet St. from 150 feet south of Linden St. to Eureka St., on Florence Ave., Fairview Ave. to lot No. 9; on Weadock Ave., Kibby St. to Vine and on Tanner St., Second to Third St. But legislation was not ordered for these sewers. Matter was referred to finance committee to recommend after estimates of city engineer have been made.

**Marion, O.**—Council has ordered sewers to be constructed in several streets.

**Springfield, O.**—Estimates for two additional improvements that may be included in year's construction program were submitted to City Manager Ashburner, Jan. 29, by Chief Engineer M. J. Bahin for preparation of necessary legislation before being tendered to city commission. One estimate will provide for grading, curbing and gutters, construction of sanitary sewer and paving with either water proof macadam or asphaltic concrete of Summer St. from East to York with sewer connections to the proposed sewer extension in East St. between Kenton and Clifton. Sewer in Summer St. is petitioned for by property owners, according to Chief Engineer Bahin, and will be joined with East St. sewer under a revised estimate covering the construction of both. Second estimate calls for sanitary sewer in Montgomery Ave. from Pleasant St., two blocks south.

**Urbana, O.**—Action taken by city council at meeting Jan. 27 indicates that five bond issues will be voted on at special election March 14. One for \$5,000 for storm sewers including Water and Miami Sts.; one for \$10,000 for the paving of Miami St.; one for \$3,000 to build a new engine house in the Fourth ward; one for \$8,000 for paving other streets and one for \$8,000 for storm sewers on other streets.

**Youngstown, O.**—City will sell bond issue for sewer purposes.

**Poteau, Okla.**—See "Water Supply."

**Enterprise, Ore.**—Council has authorized issuance of \$24,000 lateral sewer bonds. Bids will probably be opened Feb. 14. Bonds to run 10 yrs. and will bear 6 per cent. interest.

**Portland, Ore.**—Resolutions before council directing city auditor to advertise for proposals for construction of 3 lateral sewers in Mt. Tabor and Montavilla districts. Award of contract for construction of sewer in Front St. recommended by Commissioner Dieck to Wm. Lind for \$3,243; for cement pipe, as well as contract for cement sewer pipe in E. 28th, Eugene, Brazee and Russell Sts., for \$2,212.

**Radnor, Pa.**—Mrs. Arthur Van Harlingen, of Rosemont, has appealed to the Radnor township commissioners to investigate feasibility of co-operation with Haverford township in getting comprehensive system of sewers for lower portion of Radnor township, particularly Whitehall section near Bryn Mawr. Haverford township commissioners, it is expected, will prepare sewer measure to go before people next spring.

**Williamsport, Pa.**—City engineer has been authorized to take such steps as are deemed necessary to investigate means whereby plans for sewage disposal plant can be built.

**Corseana, Tex.**—Three bond issues aggregating \$125,000 have been approved by attorney general's department, all bearing 5 per cent. interest and maturing in 40 yrs. The issues are as follows: School buildings, \$25,000; street paving, \$80,000; sewer extension, \$20,000. The department also approved an issue of \$6,000 water works bonds of Winters, Runnels County, 40-30s. 5 per cent.

**Dallas, Tex.**—Magnolia, Caruth and Hord Sts. will be supplied with storm sewer and, in consideration of its construction, city will be relieved of storm damage claims filed by property owners. Report recommending construction of sewer was filed at meeting Jan. 28 by Commissioner Lang and the report was adopted. Estimated cost of sewer is \$5,348.

**Norfolk, Va.**—See "Water Supply."  
**Olympia, Wash.**—On account of delay in publication of notice by newspaper, contract for the grading and draining of 10 miles between Ellensburg and Vantage on Sunset highway will not be awarded until Feb. 21. Original date for opening bids was Feb. 14.

**Racine, Wis.**—See "Lighting & Power."

**Superior, Wis.**—Resolution introduced by Mayor Konkel for construction of sewer in alley between West Third St. and West Fourth St. from Richardson Ave. to Nelson Ave. has been approved.

**Niagara Falls, Ont.**—City council at

special meeting Jan. 31 heard representatives of Oneida Community, Ltd., in reference to its proposed new silverware factory on Noyes estate. Company had asked for sewer connection and fixed assessment for 10 years. Both requests were granted by council. It was decided to build sewer from River Rd. to the Oneida Community's plant on Noyes estate at expense of city, on condition that Noyes estate give city the right to construct a sewer through its property so that property in neighborhood can be provided for. Proposed sewer will run to an outlet on International Railway Co.'s property. Assessment was fixed at \$6,500 for a period of 10 years. City Solicitor McBurney was instructed to draw up the agreement as outlined. Proposed sewer will be 8 ins. in diameter and will cost approximately \$300 to construct.

#### CONTRACTS AWARDED.

**Los Angeles, Cal.**—To J. C. Wolkjevic, for construction of sewer in Kingsley Drive and Fountain Ave., at \$2,045.

**Stockton, Calif.**—For storm sewers in southern part of city to Chambers & Heasley. Estimated cost, \$21,340. H. T. Compton is City Engr.

**Hartford, Conn.**—To O'Neill Bros., 24 Pawtucket St., at \$7,351, for constructing sewer in Park St.

**Key West, Fla.**—For constructing sewer system, to John J. Quinn & Co., Miami, Fla., at \$350,000. Will require 30 miles 8 to 24-in. vitrified and salt glazed sewer pipe, cast iron outfalls.

**Champaign, Ill.**—To Wm. L. Stewart, Urbana, Ill., at \$7,699, for constructing sewer improvements in Branch No. 23.

**South Bend, Ind.**—Contracts were awarded Feb. 1 by board of public works for laying of sewers on Corby and Caroline Sts. They went to De Paep & Coussens. Corby St. Improvement will cost \$1,643 and Caroline St., \$1,008.

**Lisbon, Ia.**—For constructing lateral sewers, including pipe line, manholes, etc., to M. S. Jackson, Cedar Rapids, Ia., at \$26,226. For outlet sewers and disposal plant, to Percy P. Smith, Cedar Rapids, Ia., at \$8,550.

**Boston, Mass.**—To George J. Regan, at \$1,642.40, for pipe sewers and drains in Oakland St. between Rockdale and Hollingsworth Sts. and Oakland St., from Richmond Rd. about 150 ft. easterly to Dorchester. Other bidders were: Jas. L. Pierce, \$1,672.50; John P. Lynch, \$1,690.50; E. S. Butterfield & Co., \$1,782.00; John Guarino, \$1,995.00; Antony Celfalo, \$2,357.00; Frank Drinkwater, \$2,385.00; Daddario & Booth, \$2,632.00; Barletta-Cartullo Co., \$2,682.00. Engineer's estimate, \$2,267.00.

**Flint, Mich.**—Contracts for furnishing of vitrified sewer pipe to be used in constructing sewers in Flint this year were awarded by common council Jan. 31. Total of 17,180 ft. was ordered purchased and of this 3,690 was awarded to Flint Coal Co. and 13,490 ft. to J. P. Burroughs Co. Contracts were made contingent on carrying of bonding proposition which was submitted to the electors Feb. 3.

**Saginaw, Mich.**—To South End Gray Iron Foundry Co., Saginaw, for sewer and water castings, at \$1.78 per 100 lbs.; to L. C. Smith & Co., Saginaw, 3 to 8, at 23 per cent. off; cement sewer pipe, Consolidated Coal Co., Saginaw, at 80 per cent. off. H. S. Gay is City Clerk.

**St. Paul, Minn.**—For constructing sewers in various streets as follows: O'Neill & Preston, at \$3,142, for Fairview St.; E. G. Carlson & Co., at \$319, for Denslow St.; Feyen Construction Co., at \$3,548, for Dale St.; C. A. Nelson, at \$1,742, for Annapolis St.

**Chillicothe, Mo.**—City council Jan. 31 awarded contract for construction of Calhoun and Elm St. and Elmdale sewers to Charles R. Dayton. His bid for three sewers was \$1,009.52. Bids of G. W. Barkwell was \$1,036.20 and John F. Meek, Jr., \$1,038.40.

**Mt. Olive, N. C.**—By city for sewer system to J. B. McCrary Co., Atlanta, Ga. Estimated cost, \$19,000.

**Cincinnati, O.**—For improving sewers in Colerain Ave. from Brashears St. to Mill Creek to Thomas P. Strack, Cincinnati, at cost of \$11,971.

**Mansfield, O.**—To Ohio Valley Contracting Co., of Cincinnati, for constructing sewage disposal plant at \$74,055. W. J. Hazeltine is City Engineer.

**Middleton, O.**—To W. J. Roberson at \$12,090, for constructing storm and sanitary sewers in various streets.

**Toledo, O.**—For uncompleted portion of Main Sewer No. 11, subdistrict No. 2, to Gessner & Cothrell, Toledo, O. Herbert McKeckney is City Engr.

**Youngstown, O.**—For Hartford Ave. sewer to P. & P. J. Grady at \$2,649.15.

**Houston, Tex.**—For constructing sewers in various streets as follows: To Davis Bros., at \$13,000, for Day St. and Eagle Ave.; to F. D. Horton & Sons, at \$26,500, for Leeland Ave. and Andrew St.; to Jerome Cochran, at \$2,500, for special work in Caroline St. and Franklin Ave.; also Caroline St. and Congress Ave.

**Huntington, W. Va.**—To Sluss-Baker Constr. Co., Graham, Va., at \$55,000, for constructing lateral sewers.

**Superior, Wis.**—To Riches & Son for construction of sewer in alley between Elmira and Washington Aves.

## WATER SUPPLY

**Dixon, Cal.**—R. Pedder, of Concord, Dixon, Davis, Winters and Vacaville, has filed with railroad commission an application of authority to install water system just outside the town limits of Dixon, to serve Mayes Bungalow Addition.

**Loveck, Cal.**—Citizens have voted in favor of \$90,000 bond issue for purpose of installing municipal water system. Board will open bids Mar. 6th for bonds.

**Los Angeles, Cal.**—Approval of Los Angeles water bond issue of \$2,604,000, proceeds of which will be used for distributing system in San Fernando valley, has been given by state bond commission at Sacramento. As a result of this approval, bonds may legally be handled by banks and trust companies. Sale of bonds is scheduled for May 7, when the board of supervisors will open bids for issue.

**Pasadena, Cal.**—Following bids have been received for Water Works Supplies: Hunter Brokerage, 20-in. C. I. A. at \$35.90 per ton, 4-in. C. I. B. at \$36.90 per ton, fittings \$70.00 per ton; U. S. C. I. Pipe Co., 20-in. C. I. A. at \$37.60 per ton, 4-in. C. I. B. at \$39.60 per ton, fittings at \$65.00 per ton; American C. I. Pipe, 20-in. C. I. A. at \$37.60 per ton, 4-in. C. I. B. at \$39.60 per ton, fittings at \$65.00 per ton; K. E. Allan, 20-in. C. I. A. at \$46.00 per ton, 4-in. C. I. B. at \$44.50 per ton, fittings at \$75.00 per ton. S. B. Morris is engineer.

**Sacramento, Cal.**—Water main along M St. will be extended a distance of 2,000 ft. to accommodate prospective residents beyond Schmidt's gardens. Commissioner Coulter decided upon this extension following request from property owners who desire to settle in that district.

**Seal Beach, Cal.**—Residents of this municipality will be required to go to the polls and vote for acquisition of water, sewer and street-lighting system shortly. Present water system, owned and installed by Bayside Land Co., will in all probability be taken over by city. Committee of city officials and citizens will be appointed this week to investigate and report on satisfactory sewer system, and street-lighting plant. Sewage system is by far most important question facing trustees, as the present cesspool drainage is anything but satisfactory.

**Wilmington, Del.**—Report of George W. Fuller of New York, an expert, recommends new reservoir at Eighth and Rodney Sts., at probable cost of \$600,000.

**Wadley, Ga.**—Tank of from 25,000 to 50,000 gallons capacity and an 80-ft. tower will be erected for water works system.

**Mishawaka, Ind.**—Superintendent Klein has been instructed to obtain prices on brass goods needed and on about 300 meters and he was likewise ordered to secure prices on new test wells to be installed in connection with east end pumping plant. Sanitary Officer H. E. Strubbe submitted a report showing the analysis of nine water samples of city water to be very acceptable. Mr. Klein was authorized to obtain prices on an auto with truck body to be used in connection with his department.

**Iowa City, Ia.**—Water Co. contemplates construction of covered filtering basin with a capacity of 700,000 gallons.

**Emporia, Kan.**—Petition has been presented to Commissioners asking that work be started as soon as possible on improvements for water department.

**Mount Sterling, Ky.**—City contemplates purchase of municipal plant of water department.

**Paris, Ky.**—Committee composed of members of city council has been appointed by Mayor Hinton to secure an option on plant of the Paris Water Co. There has been considerable agitation toward a municipally owned plant, and steps will be taken immediately to secure option on concern which is owned by Boston capitalists.

**Opelousas, La.**—Board of aldermen has let following contracts for repairs to city power and water system, deep well to Layne & Bowler Co., of Rayne, La.; engines for power house to Metz & Weiss, of New York; water and light meters to the Pittsburgh Meter Co.; power plant building to Thurston McKinney, of Opelousas. The total cost of the repairs and improvements contracted for is between \$19,000 and \$20,000.

**Warren, Mass.**—This town, together with Belchertown and Bernardston, contemplate bond issue for water works purposes.

**Flint, Mich.**—See "Sewerage."

**Chisholm, Minn.**—Water commission authorized Supt. C. J. Sullivan to issue call for bids on 6-in. pipe necessary to cover extensions of the village water mains. It is estimated by Supt. Sullivan that a bid will be asked on 6,000 ft. of 6-in. cast-iron pipe. Of this amount 2,500 ft. will be laid in Pierce addition, about 800 ft. in Western addition and about 400 ft. in the Carlin addition. The balance of the pipe will be carried in stock. Call for bids will not be made for a week or ten days and will not be opened before March 20.

**Kansas City, Mo.**—Advertisements for bids on approximately \$16,000 worth of "reserve stock" for fire and water board have been authorized. Stock includes 300 hydrants, as many 6-inch valves, fifty 4-inch valves and 200 tons of pipe. Board made contract for liquid chlorine, of which it will use approximately 3,000 gallons a month in the filtration of city water. The price was 13½ cents a gallon. Heretofore, hypochloride of lime has been used at 1½ cents a pound. However, war has sent the price of hypochloride up to 15 cents a pound and the change was made necessary.

**Kansas City, Mo.**—Fire and water board Jan. 27 authorized expenditure of \$17,000 for cleaning basins at pumping station at Turkey Creek and building of two new retaining walls and drain sewer.

**Newark, N. J.**—Bids for installation of high pressure water system at new almshouse at Ivy Hill were thrown out at meeting of public buildings committee of common council Feb. 4. It is proposed to advertise for new bids shortly.

**New Brunswick, N. J.**—Following bids for two 5,000,000-gallon turbo-centrifugal pumps were received Feb. 3: Southwark Foundry & Machine Co., Philadelphia, Pa., at \$10,900; Turbine Equipment Co., New York, at \$13,700; Thomas J. Radley, New York at \$13,900. Bid includes delivery and erection exclusive of piping. Steam pressure 165 lbs., head 125 ft. Foundations by city. A. Alkinson is city engineer.

**Rahway, N. J.**—Important recommendations contained in annual report of Superintendent A. F. Kirstein were adopted by board of water commissioners last night and when put into execution will give better fire protection and water service in certain sections of the city. Board authorized purchase committee to secure material needed and work will be started when the weather permits. Most important of recommendations are: Extension of mains, with fire hydrants at intervals. In East Grand St. from Monroe St. to Lenning St., distance of 1,675 ft., and extension of mains in Hazelwood Ave. from present "dead end" to St. George Ave. Another extension recommended is along St. George Ave. from Meadow St. to Inman Ave., and thence to Jacques Ave. Other smaller gaps in the circulation system are to be connected. Cost of entire improvement is estimated at about \$4,500. East Grand St. and Hazelwood Ave. improvements will be taken up first and put through this year.

**New York, N. Y.**—The board of water supply opened bids Feb. 1 in its offices at Municipal Building for lining of Catskill Aqueduct a length of 1,200 ft. directly beneath 23d St., Manhattan. It was discovered that small fissures and cracks had appeared in concrete at this point, with result that it will have to be lined with concrete 5-6 in. thick. Lowest bid was that of Lupfer & Remick, a Buffalo contracting firm, which will do work for \$130,000, or \$108 per ft.

**North Tonawanda, N. Y.**—Under plans of North Tonawanda board of public works, about \$40,000 will have to be expended on water works station this year. A new engine is necessary. Matter will probably be placed before taxpayers of city at special election soon.

**Rochester, N. Y.**—Superintendent of Parks Calvin C. Laney reported at meeting of park department heads, held Feb.

2, with Commissioner Lamberton presiding, that he had obtained estimates on cost of laying water pipe to buildings in Durand-Eastman Park. It is planned to lay a 3-in. main, a distance of 6,000 ft., to supply bath house, refectory, zoo, shelter and grove house. Expense is estimated at \$3,200.

**Rome, N. Y.**—Members of water board favor purchase of machinery for sterilization of water.

**Waterloo, N. Y.**—Improvements contemplated by Waterloo Water Co. include a new filter house, a liquid chlorine apparatus and a complete chemical laboratory.

**Wilson, N. C.**—At recent meeting of aldermen plans and specifications for new gas and water works improvements were presented by Anderson & Christie, engineers for city, and were accepted. At the same time contract for the pipe to be used in work was awarded to Lynchburg Pipe & Foundry Co., of Lynchburg, Va., that company offering lowest bid. Contract will amount to approximately \$45,000 and shipment of the pipe will begin shortly. Contract for both gas and water plant will be advertised at once. Bids will not be received later than 10 days, work to begin within 10 days after contract has been awarded.

**Lima, O.**—Prompt official consideration will be given to report of Clark & Pratt, hydraulic experts, as to solution of Lima water supply problem. Bond issue to make an improvement in some form probably will be decided on. These were decisions reached at special meeting of city council Feb. 1. Recommendations of Clark & Pratt, in general, are: That an 800,000,000-gallon reservoir, to be filled from Ottawa river by 50,000,000-gallon-a-day pumps be constructed in the Lost Creek basin, at a cost of \$363,548; that filtration plant be built at East Lima pumping station at cost of \$110,000, and that East Lima station be improved and enlarged at a cost of \$72,820, making a total expenditure of \$549,368.

**Poteau, Okla.**—City has retained Benham Engineering Co., consulting engineers, Oklahoma City, Okla., to make investigations and recommendations for a new and larger water supply, also to prepare plans and specifications for water works and sewer extensions and sewage treatment plant. Estimated cost of work \$60,000. Dan W. Patton, mayor, and Mat X. Beard, city clerk.

**Baker, Ore.**—Council has decided on Feb. 8 as date when bids will be again opened for \$75,000 issue of water bonds for which bids were recently rejected.

**McMinnville, Ore.**—Geo. E. Scott, Portland, has proposed to water and light company to furnish 1,500,000 gals. of water per day from drilled wells within a radius of 7 miles of McMinnville for \$15,250, guaranteed.

**Milwaukee, Ore.**—J. I. Johnson, stockholder Minthorne Springs Water Co., will extend his system to include all of the town and will buy competing companies and make improvements. Capital of company to be raised to \$50,000, from \$20,000. It was announced recently that Milwaukee Water Co. will sell its complete water works to the city for \$6,500.

**Erie, Pa.**—Bids for 175 meters, to replace worn-out ones, were also received by Commissioners. Because of closeness in prices quoted, it was decided to tabulate bids before awarding contract. Seven companies also sent in bids for this work. They are: R. D. Wood & Co., Ludlow Valve Co., Chapman Valve Mfg. Co., Standard Pipe & Supply Co., Palace Hardware Co., Eddy Valve Co., and the Rensselaer Valve Co.

**Harrisburg, Pa.**—Public service commission has approved following contracts: Philadelphia Co. and Allegheny County, granting the right to construct a 20-in. pipe line on bridge No. 4 over the Monongahela River. Equitable Gas Co. and Jefferson township, Allegheny county to furnish natural gas for municipal buildings. Duquesne Light Co. and Wilksburg for lighting the streets for five years. Pennsylvania Railroad Co. and Altoona, granting right to construct a water main under the company's right of way, at Ninth Ave. and 23d St.

**Newport, R. I.**—Installation of 12-in. reinforced mains between Bellevue Ave. and Thames St. has been recommended.

**Amarillo, Tex.**—W. F. White of Fort Worth Life Insurance Co. is in Amarillo perfecting plans for construction of a giant reservoir which will supply Amarillo and Canyon with water. A big dam

is to be built in Palo Duro Canyon, near Amarillo. Application has been filed by White, D. C. Priddy and Dan O. Martin of Amarillo with state board of water engineers asking for permission to build this dam. It will give Amarillo 3,000,000 gallons daily, and Canyon 400,000 gallons, it is claimed.

**Corsicana, Tex.**—See "Streets and Roads."

**Dallas, Tex.**—Two bids on furnishing city with 1,500 water meters or as many more as are needed opened Feb. 1 by board of city commissioners will be rejected, Water Commissioner A. C. Cason announced. The city probably will go into open market to buy the meters. "I do not feel like closing a contract worth \$12,000 on only two bids," Commissioner Cason said. Two bidders were Hersey Mfg. Co. and National Meter Co. The former offered prices ranging from \$5.90 to \$6.28 on  $\frac{1}{2}$ -in. and from \$11.47 to \$12.80 on 1-in. meters. The National bid \$6.75 on  $\frac{1}{2}$ -in. and \$12.80 on 1-in. meters.

**Galveston, Tex.**—Plans are being prepared by engineering department of Gulf, Colorado & Santa Fe Ry. for construction of \$75,000 dam across Brown's Creek near Lampasas Springs, Mills Co., which will have a capacity of 300,000,000 gals. of water. Purpose of the proposed dam is to insure an adequate fresh water supply for general needs of railroad and for engines on Lampasas branch of the Santa Fe. It is planned to make dam one-quarter of a mile in length. Its height will vary from 25 to 30 ft. The spillway, over which surplus water will pour when the lake is filled, will be from 250 to 300 ft. in length.

**Norfolk, Va.**—Street committee have recommended bond issue of approximately \$50,000 for purpose of extending water works, sewerage, erection of filtering plant, and permanent street improvements.

**Albion, Wash.**—Council plans installation of system of water works here. C. E. Wright, C. E. Calvert and Rev. Elwood Harrold, committee.

**Bellingham, Wash.**—City comptroller has been instructed to advertise for bids for 396,000 lbs. of 6-in. cast iron pipe and 48,000 lbs. of 4-in. cast iron pipe for immediate use and City Engr. W. H. North will supply estimate at next meeting of amount that will be used in spring and summer. Question of water meters is before council.

**Colville, Wash.**—Agitation has been started for new water supply system with a better head.

**Everett, Wash.**—City council has decided to begin suit against the Everett Railway, Light & Power Co. to acquire by condemnation company's system for distributing water in city.

**Seattle, Wash.**—Fire Chief Stetson has recommended installation of high pressure water system for fighting fires in business district at an approximate cost of \$1,000,000. He favors construction of additional reservoir of 420 feet elevation with mains running to section now covered by low service reservoirs and that subdivision into 40 and 20 million gallon reservoirs of proposed 60,000,000 gallon capacity reservoir in Volunteer Park, with supply in the smaller reservoir reserved for use of fire department. Installation of three turbine electrically driven high pressure pumps at Lake Union municipal light station is recommended. Further recommendation is for laterals from waterfront on every other street between Pine and Walker Sts., for fire boat and salt water connections.

**Tacoma, Wash.**—Work will start today on laying 16-in. water main from Puget Sound flouring mills to McCarver St. Cost, \$12,000.

**Milwaukee, Wis.**—Sealed proposals will be received at office of department of public works until Wednesday, Feb. 9, at 10.30 a. m., for furnishing for use of water department, 1,200 tons of 6-in., 250 tons of 8-in. and 250 tons of 12-in. class "C" water pipe.

**Milwaukee, Wis.**—Sealed proposals will be received at office of department of public works until Tuesday, Feb. 15, at 10.30 a. m., for furnishing and delivering for use of water department, 1,000  $\frac{1}{2}$ -in., 1,000 1-in. and 100  $\frac{1}{4}$ -in. curb cocks.

**Sheboygan, Wis.**—Commissioners have discussed the purchase of new pump, but nothing definite was decided upon. Commissioners probably will award contract shortly.

**Sheboygan, Wis.**—Representatives of different large iron concerns have been in the city recently to interview Supt. Koehn in connection with proposed improvements at the municipal water works pumping station.

**Stevens Point, Wis.**—Purchase of local water works system is being discussed. Special election may be called to vote on proposition.

#### CONTRACTS AWARDED.

**Los Angeles, Cal.**—Resolution has been adopted awarding contract for furnishing certain water pipe for Los Angeles County Water Works District No. 3, to Lacey Mfg. Co.

**Los Angeles, Cal.**—Resolution has been adopted awarding contract for trench digging machine for Los Angeles County Water Works District No. 3, to Austin Excavation Co.

**Los Angeles, Cal.**—Resolution has been adopted awarding contract for furnishing water pipe for Los Angeles County Water Works District No. 3, to Llewellyn Iron Wks.

**Manteca, Cal.**—For constructing Woodward reservoir for So. San Joaquin Irrigation District to Keystone Construction & Logging Co., 1021 Yeon Bldg., Portland, Ore., at \$155,410. Will include appropriation of site requiring 15,000 cu. yds. excavation, 4 canals, No. 2 requiring 523,000 cu. yds. excavation and Dam 3 and 4 requiring 22,000 cu. yds. excavation.

**Yorba Linda, Cal.**—To Cameron Steam Pump Works, Los Angeles, for one 8-in. Cameron horizontal, double-suction, volute pump 150 hp., Westinghouse motor automatic control. F. C. Finkle is Engineer, Los Angeles; Eldo R. West is Secy. Yorba Linda Water Co.

**Chanute, Kan.**—For improving municipal water works system, to Merkle-Hines Machinery Co., Kansas City, Mo., at \$19,200.

**Emporia, Kan.**—For about 400 tons c.-i. pipe, to National Iron Pipe Co., Black & Veatch, engineers, Kansas City, Mo. Fred H. Smith is city clerk.

**Oswego, Kan.**—For improving water works system awarded as follows: c. i. pipe and valves to N. S. Sherman Machine & Iron Co., Oklahoma, Okla., at \$14,771; pumping equipment and piping to Merkle-Hines Machinery Co., Kansas City, Mo., at \$2,205; filter equipment to New York Continental Jewel Filtration Co., Kansas City, Mo., at \$5,500; tower and tank to Chicago Bridge & Iron Wks., Chicago, Ill., at \$5,053. J. C. Moore, Joplin, Mo., is Engr.

**Anson, Me.**—By Anson Water District for 14-in. pipe line from Hancock pond to Hansom Construction Co., Boston, Mass. Estimated cost, \$75,000.

**Mt. Morris, Mich.**—To Caster Bros., St. Charles, Mich., for first of 8-in. wells which will be drilled for this city.

**Paynesville, Minn.**—To J. G. Jerabek for installation of a 15-h. p. motor pump at water works.

**Danville, Pa.**—For constructing reinforced concrete rapid sand filter, 300,000 gallon capacity, to American Water Softener Co., 1011 Chestnut St., Philadelphia, Pa., at \$2,775.

**Erie, Pa.**—Contract for 73 valves and boxes was awarded by water commissioners to R. D. Wood & Co., of Philadelphia. Their bid was \$1,390. Six other companies also bid on contract. The valves are of 6, 12, 16 and 20-inch type.

**North Yakima, Wash.**—To Harrington-Peters Co., Seattle, for clearing Keechelus Reservoir site, at \$129,000.

**Ridgely, Wash.**—For constructing 200,000 gallon concrete lined reservoir, and 18,000 feet 4, 6 and 8-in. wooden pipe line, to Morris & Kinney, Seattle, Wash., at \$6,877.

**Seattle, Wash.**—By board of public works, to Scalzo & Tassoni, 1708 22d Ave. S., for water mains in Dexter Ave., at \$25,833.

**Seattle, Wash.**—For pumping plant and salt water mains for new natatorium in Second Ave. and Lenora St. to Gray & Rarash, First Ave. and Jackson St., Seattle, to cost approximately \$31,000. E. H. Dimock is City Engr.

**Sheboygan, Wis.**—At meeting of board of water works commissioners at city water works office, Jan. 28, contract for delivery of new boiler was awarded to Casev-Hedges Co., of Chattanooga, Tenn., at \$4,080. Smoke connections will be installed by Optenberg Iron Wks. of this

city at an expense of \$160, making the total cost of the work \$4,240.

#### MISCELLANEOUS

**Ketchikan, A. T.**—Inspector of 16th lighthouse district, Ketchikan, A. T., will receive proposals until Feb. 17 for sheet metal work and until Feb. 10 for 18-ft. copper tubing for use on St. Elias light station.

**Los Angeles, Cal.**—Resolutions adopted authorizing the city attorney to prepare contracts with the Panama Lubricants Co., the Richfield Oil Co., Union Oil Co. of California for furnishing of gas cylinder oil for various city departments.

**Bridgeport, Conn.**—Issue and sale of bonds to amount of \$2,275,000 was recommended to common council by special advisory committee, of which John T. King is chairman, at the adjourned meeting of the council Jan. 31. These bonds are to be issued for following improvements, if the people authorize their issue at special referendum election which it is believed will be held during latter part of April or first part of May: \$300,000 for grade schools and sites; \$500,000 for street pavements other than waterbound macadam; \$500,000 for new sewers; \$750,000 for clinics for the treatment of infectious diseases; \$125,000 for new police and fire buildings; \$275,000 for parks, the extension of the Seaside Park sea wall and a bridge at Black Rock; \$250,000 for street extensions for the purpose of relieving traffic congestion in the center of the city, and \$250,000 to cover the land damages which will be incurred in the construction of the bridges at Stratford Ave., Grand St. and at East Washington Ave.

**Wilmington, Del.**—Following a recess Feb. 3 when a communication from Colonel John Biddle, United States engineer in charge of this district was considered, city council approved payment of \$100,000 to government for harbor improvements.

**Wilmington, Del.**—See "Water Supply."

**Brazil, Ind.**—The city council Feb. 1 purchased 42 ft. of ground fronting on National Ave., east of city's present property, for \$4,400. Ground was purchased in view of erecting new city hall in a few years.

**Jacksonville, Fla.**—Commissioner Smoot reported that it would cost from \$1,800 to \$3,800 to build proposed skating rink in playground, depending upon type of rink desired. Council is to be asked to provide funds.

**Atlanta, Ga.**—City contemplates great improvements in several parks to be done this year.

**Columbus, Ind.**—Committee of ten business men has been formed to lead campaign for purchase of Perry park. Petition will be presented to council Feb. 7.

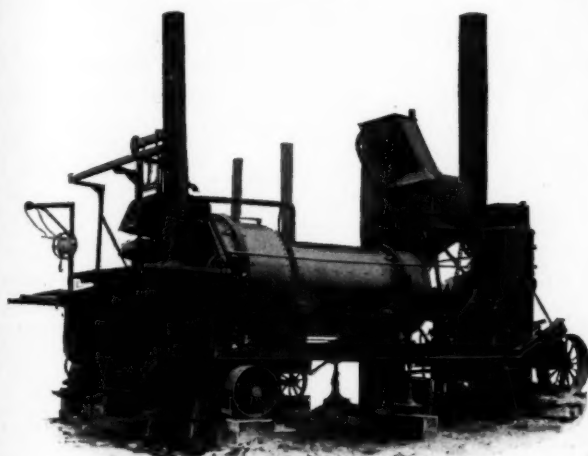
**Muncie, Ind.**—Councilmen will be asked for an appropriation of \$5,000 to be used in building at once a concrete levee from Pennsylvania railroad bridge to Elm St. bridge.

**Vincennes, Ind.**—Board of school trustees of Vincennes sold \$135,000 4 per cent set of bonds to Fletcher American National Bank, of Indianapolis, for a premium of \$1,530. This is largest bond issue sold in Knox county in years, according to records. The bonds will run for 20 years, first payment of \$3,000 will be made on Aug. 1, 1921, second \$5,000 on Feb. 1, 1922, and \$5,000 every six months thereafter until the entire amount is paid. J. F. Wild & Co., Indianapolis, bid \$576; Breed, Elliott & Harrison, Indianapolis, \$550; the Wabash Bank, Vincennes, \$705, and the Second National Bank, also of this city, \$355.

**Winchester, Ind.**—Louis S. Cole of Chicago, was in city Feb. 3 and met with Goodrich Bros. and city council for purpose of planning city park. Plans and blue prints have been made. It is thought that an artificial lake will be made.

**Emporia, Kan.**—Bids on dams and revetment work on Neosho River were opened at meeting of city commission Feb. 1. Four bids, by Kansas City and Leavenworth contractors, were submitted. Bids were asked on wicket gate dam, monolithic concrete dam and revetment work. The engineers' estimates on work were \$8,720 for the wicket gate dam, \$8,700 for monolithic concrete dam, and \$7,200 for revetment work. McCoy & Taylor Construction Co., of Kansas City, Mo., bid \$7,985 on wicket gate dam, \$7,077.50 on concrete dam, and \$7,902.30 on revetment work. Kansas Paving & Construction Co., also of Kansas City, made lump bid of \$18,500 on second and third items. The O'Neil Construction Co., of Leavenworth, put in bids of \$9,150 on

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BOXES, GONGS, Etc., Etc.  
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**MUNICIPAL JOURNAL**

wicket gate dam, \$7,760 on concrete dam and \$12,506 on revetment work. Edward Jones, another Leavenworth contractor, offered to build wicket gate dam for \$9,630, monolithic concrete dam for \$7,770, and revetment work for \$11,154. Following closing and opening of bids, commissioners went into executive session with N. T. Veatch, Jr., of Kansas City, of firm of Black & Veatch, consulting engineers, who prepared specifications and contracts. After some discussion commissioners decided to hold over letting of contracts on bids submitted and no definite action was taken.

**Chesapeake City, Md.**—Citizens are petitioning Maryland Legislature for authority to issue bonds in amount of \$10,000 to be used in town improvement.

**Greenfield, Mass.**—Water commissioners have voted to build workshop and storage house for use of district at cost not exceeding \$4,500.

**Holyoke, Mass.**—Plans were approved Jan. 31 for waiting room and comfort station in basement of city hall under office of the city treasurer and board of aldermen's room, one of two plans will be selected for proposed new isolation hospital; an addition will be made to tuberculosis hospital as well as erection of a shelter house for men patients; office of the city auditor will be moved to main floor of city hall and arrangements made to use ante rooms adjoining the municipal auditorium as checking and rest rooms.

**Hibbing, Minn.**—Recorder D. D. Haley has been instructed to issue call for bids on an incinerator plant to be erected probably on lots belonging to Oliver Iron Mining Co. and located on McKinley St., between Fourth and Fifth Aves. Mining company has offered the use of these lots for that purpose.

**Hibbing, Minn.**—Two petitions submitted by residents of Alice, residential suburb of Hibbing, asking for purchase of a snow plow with which to keep road between Hibbing and Alice clear for travel in case of snow storms, were referred to street and alley committee.

**Newark, N. J.**—Mayor has urged construction of new police building.

**New Brunswick, N. J.**—Bids for two turbo-centrifugal pumps to be installed at Weston's Mill station were opened at meeting of city commission Feb. 1, there being three bidders as follows: Thomas J. Radley Co. (Inc.) of New York City, \$13,900; Southwark Foundry & Machine Co., of Philadelphia, \$10,900; Turbine Equipment Co. of New York City, \$13,700. Bids were referred to the department of public affairs, and award of contract will likely be made Feb. 8.

**Albany, N. Y.**—Tentative plans for erection of new penal institutions for Albany County call for sale of the present jail site of 40 acres on Delaware Ave. and sale of site of the county almshouse on New Scotland Ave., 34 acres, and purchase of a farm in country of approximately 1,000 acres. Then almshouse and penitentiary and county jail to house county prisoners only, could be built on this new site.

**Albany, N. Y.**—Supt. of Public Works Wotherspoon to-day opened bids for additional Barge Canal construction work, among them one for completion

of a new route from Sterling Creek to the Herkimer-Oneida County line. The bidders were: Troy Public Works Co., Utica, \$190,086; Grant Smith & Co., Rome, \$220,950; Eastover Construction Co., Utica, \$186,434; F. H. Wells, \$158,055. The engineer's estimate for the work was \$162,005. Wells undoubtedly will get contract.

**Binghamton, N. Y.**—It is estimated that \$2,500 will be needed to make necessary repairs to wall near western abutment of Court St. bridge on Main St., to dangerous condition of which attention of council was directed by Commissioner of Public Works John A. Giles and City Engineer W. Earl Weller. Matter has been referred to highway committee, which is expected to report at council meeting Feb. 7.

**Brooklyn, N. Y.**—The final stage of work of connecting Flatbush transit facilities with dual subway system will begin Feb. 10, when Public Service Commission will open bids for construction of subway along Flatbush Ave., between Park Plaza and Malbone St. Trains from Flatbush along the Brighton Beach line will be diverted into new subway at Malbone St. and will travel to Manhattan via B. R. T. subways.

**Niagara Falls, N. Y.**—When Harbor Advisory Commission meets for organization it will probably consider tentative plans for municipal dock near city water works pumping station and filtration plant. For opening of new 14-ft. channel from foot of Grand Island to foot of Sugar St. in spring will make Niagara Falls a lake port. Until a municipal dock is built Niagara Falls Power Co.'s dock will be used.

**Niagara Falls, N. Y.**—Councilman Gillett, chairman of committee on police station, reported to City Council Jan. 31 that Architects Wright and Kramers had outlined plans for new police station in place of present headquarters in Niagara St., which Mr. Gillett said would meet requirements of State Prison Commission. He said it would cost \$35,000 to remodel headquarters and \$36,000 to build new station. Necessary equipment for remodeled or new building would be \$4,000. Report was tabled until next meeting of Council.

**Chillicothe, O.**—City engineer has been instructed to prepare plans and estimates for viaduct and under grade crossing on Main St. for N. & W. and B. & O. railroad crossings at Main and Sugar Sts. H. M. Redd is city engineer.

**Eugene, Ore.**—Council will consider amendment to city charter providing for creation of drainage district in the south portion of city, so that Amazon slough can be drained at expense of property owners. Election is in April.

**Eugene, Ore.**—Town is discussing plans for construction of jail.

**Portland, Ore.**—City council has authorized call for bids for \$565,000 in auditorium bonds, to be opened Feb. 21. Bids will be asked for delivery Apr. 1 and separate bids for delivery \$150,000, Apr. 1; \$150,000, July 1; \$150,000, Oct. 1, and \$115,000, Jan. 1, 1917. Bonds run 30 years.

**Central Falls, R. I.**—Resolution has been passed providing for combination police ambulance and patrol wagon to cost \$1,500.

**Corsicana, Tex.**—See "Streets and Roads."

**Dallas, Tex.**—A \$500,000 bond issue for purpose of procuring funds for establishment of municipal market house by city of Dallas is being advocated by J. H. Power.

**Galveston, Tex.**—Special election will be held March 14 to vote on \$875,000 bond issue.

**Norfolk, Va.**—Among the new business business before the Common Council Tuesday night will be a resolution from Councilman Hosler, recommending a plan for building a new city hall on the present site of the court house, for \$250,000, and remodeling and turning the entire market-armory building over to the militia for an armory at a cost of \$40,000, the latter to be done after the new market on the present site of the huckster market has been built.

**Seattle, Wash.**—U. S. Engineers' Office, Burke Building, will receive bids until Feb. 16 for construction of spillway gates for Lake Washington Canal at locksite. Each to be 8x82 ft. steel, weighing \$18,000 pounds, and will cost \$15,000.

#### CONTRACTS AWARDED

**Tempe, Ariz.**—At a meeting of directors of Tempe drainage district contract for construction of proposed drainage ditch was let to firm of Watson & Spicer of Los Angeles at a price of about \$45,000. Their exact bid was 15c. per cu. yd. for excavation and \$14 per cu. yd. for concrete work, while but a margin of \$231 below was bid of W. E. Callahan, of Omaha, Neb., at 13½c. per cu. yd. for excavation and \$17.95 for the concrete work. McWilliams company of El Paso bid 13.98c. per yard on excavation and \$19 per yard on concrete work.

**Lynn, Mass.**—Garbage contracts have been awarded by municipal council. Contract with New England Livestock Co. provides that company shall take one-third of all garbage at 50c. a cubic foot, and that the Essex Livestock Co. remaining two-thirds. Should the latter company find that it cannot handle two-thirds, New England Co. has contracted to take balance at 25c. a cubic foot.

**Crookston, Minn.**—Harold Arpin, of Grand Rapids, Wis., was awarded contracts here for digging of four county ditches in Polk Co., for which he will receive over \$27,000, he being lowest bidder for the construction of ditches Nos. 77, 93, 94 and 96.

**Fort Benton, Mont.**—Illinois Steel Bridge Co., Hutton Building, Spokane, has been awarded construction for furnishing 106,000 lbs. (estimated) steel for a 180-ft. single span steel bridge across the Teton River in Choteau County. Other bidders were: Vincennes Bridge Co., Vincennes, Ind., \$3,998; Minneapolis Bridge Co., Minneapolis, \$4,100, \$4,450; Blodgett Construction Co., Kansas City, Mo., \$4,100; Minneapolis Steel & Machinery Co., Helena, \$4,200, \$4,445; J. F. Harrington, Missoula, Mont., \$4,106.45, \$4,539.28; Iowa Bridge Co., Minneapolis, \$4,859; U. S. Bridge Co., Great Falls, Mont., \$4,876, \$5,035; Clinton Bridge Works, Clinton, Ia., \$5,100, \$5,600.

### TOO LATE FOR CLASSIFICATION

#### BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
Ind., Indianapolis	10 a.m., Feb. 21	Road graders and drags	L. K. Fesler, County Auditor	
Minn., St. Paul	10:30 a.m., Feb. 21	Grading and curbing several streets	August Hohenstein, Pur. Agt.	
Tex., Corsicana	Noon, Feb. 21	Paving several streets with first-class pavement and construction concrete curbs and gutters	J. A. Harper, City Secretary	
O., Cincinnati	Noon, Feb. 21	Resurfacing with macadam, constructing drains and inlets and setting concrete curbs and gutters	C. F. Hornberger, Dir. P. Serv.	
R. I., Providence	Noon, Feb. 23	Furnishing 400,000 gallons asphaltic road oil	State Board of Public Roads	
Ky., Louisville	Feb. 23	Laying asphalt, brick and granite block pavement; estimated cost, \$110,000	Board of Public Works	
Ind., Indianapolis	Mar. 6	Furnishing 750,000 or more gallons road oil	B. J. T. Jeup, City Engineer	
SEWERAGE				
N. Y., New York	10:30 a.m., Feb. 17	Const. 13,500 ft. 12 to 39-in. conc. & vitr. pipe sewer	Douglas Mathewson, President Boro. Bronx	
Fla., Jacksonville	Noon, Feb. 18	Installing sewers at municipal docks	J. C. O'Dell, General Manager	
Minn., St. Paul	10:30 a.m., Feb. 21	Constructing sewers in several streets	August Hohenstein, Pur. Agt.	
WATER SUPPLY				
N. J., Camden	9 p.m., Feb. 16	Venturi meter of one to fifteen million gallons capacity; one light automobile truck	Chief Engineer, Water Dept.	
N. J., Newark	3:30 p.m., Feb. 17	Meter testing apparatus, scale and steel tank	M. R. Sherrerd, Chief Engr.	
Minn., St. Paul	10:30 a.m., Feb. 21	2,435 ½ to 2-in. disc type water meters	August Hohenstein, Pur. Agt.	
MISCELLANEOUS				
Minn., St. Paul	10:30 a.m., Feb. 21	12 gross street sweeping brooms	August Hohenstein, Pur. Agt.	



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## PROPOSALS

**TREASURY DEPARTMENT, Supervising Architect's Office, Washington, D. C., January 27, 1916.**—Sealed proposals will be opened in this office at 3 p. m., March 10, 1916, for the construction of the United States post office at Kalispell, Mont. Drawings and specifications may be obtained from the custodian at Kalispell, Mont., or at this office, in the discretion of the Supervising Architect. Jas. A. Wetmore, Acting Supervising Architect.

**TREASURY DEPARTMENT, Supervising Architect's Office, Washington, D. C., January 31, 1916.**—Sealed proposals will be opened in this office at 3 p. m., February 29, 1916, for alterations to the United States post office and courthouse at Martinsburg, W. Va. Drawings and specifications may be obtained from the custodian at Martinsburg, W. Va., or at this office, in the discretion of the Supervising Architect. Jas. A. Wetmore, Acting Supervising Architect.

### Proposals for Road Oil

**SEALED PROPOSALS** will be received at the City Clerk's Office, Wilkes-Barre, Pa., until Friday, February 25, 1916, at 12 o'clock noon, for furnishing and delivering F. O. B. cars Wilkes-Barre, Pa., 40,000 gallons of road oil, more or less. Bidders will quote prices by the barrel, tank car, or otherwise, both delivered and placed on the roads, and will submit samples of the oil bid with the name or brand of oil plainly marked on each sample. Proposals to be endorsed "Proposals for Road Oil," and addressed to Fred H. Gates, City Clerk, and each bid must be accompanied by a certified bank check of the bidder in the sum of \$200.00, conditioned upon entering into a contract with the City. No action will be taken on proposals not accompanied by certified check. The City Council reserves the right to reject any or all bids.

MARTIN C. MURRAY,

Supt. of Department of Streets & Public Improvements.

### To Paving Contractors

Sealed proposals for grading, curbing and paving with vitrified block the below named streets, will be received by the undersigned at his office in the City Hall, until 11 o'clock a. m., Feb. 24, 1916.

West Water Street, from west line of Hoffman Street to City line.

Franklin Street from west line of Fulton Street to east line of Broadway.

East Church Street from east line of Sullivan Street to east line of Tuttle Avenue.

Total yardage, 18,400 square yards.

Plans and specifications are on file in the City Engineer's office, City Hall, where also may be obtained the Proposal Blanks which must be used.

Separate certified checks are required, as follows: West Water St., \$1,000; Franklin St., \$800; East Church St., \$600, payable to order of Mayor of Elmira, N. Y., must accompany the bids.

They will be returned to the bidders upon execution of the contracts.

The Board of Public Works reserves the right to reject any or all bids.

LOUIS C. ANDREWS,  
City Clerk.

## FOR SALE

One Tandem Paving Roller, in A-1 condition, at a reasonable price. Write—Baker Contracting Company, c/o Municipal Journal.

## WANTED

One 10-ton Macadam Roller. Send lowest cash price and description to—Ryan and Walters, c/o Municipal Journal.

## FOR SALE CHEAP

Wrought Pipe, second hand, all sizes, recut and rethreaded suitable for all classes of work. Prices quoted on application.

MARINE METAL & SUPPLY CO  
167 South Street, New York City

## FOR SALE

One "OO" Austin Trenching Machine with ten-foot extension, nearly new. Address J. E. Poin-dexter, Receiver, Fayetteville, Tennessee.

### NOTICE TO STREET PAVING CONTRACTORS

Notice is hereby given that sealed bids will be received by the undersigned committee on public works for the city of Richland Center, Wisconsin, at the office of the city clerk in the city hall of said city, until the 7th day of March, 1916, at two o'clock p. m., of said day for the necessary grading, furnishing of materials and construction of the following described types of pavements, to-wit:

1. A re-inforced concrete pavement, a brick pavement and an asphaltic concrete pavement on that portion of Hazeltine Street, between a point 8 feet east of the center line of the C. & M. & St. P. Ry. Co.'s east track and the east line of the Ithaca highway, the work comprising approximately 14,000 square yards of paving; 6,800 cubic yards of grading; 5,158 linear feet of curb and gutter and 7 cubic yards of concrete catch basins.

2. An asphaltic macadam pavement, a tar macadam pavement and an asphaltic concrete pavement on that portion of N. Church Street between the south line of Union Street and the south line of 8th Street, the work comprising approximately 10,863 square yards of paving; 3,500 cubic yards of grading; 4,512 linear feet of curb and gutter and 650 linear feet of concrete waterways.

3. A waterbound macadam, an asphaltic macadam, a tar macadam and an asphaltic concrete pavement on that part of N. Center Street from the south line of First Street to the south line of Eighth Street, the work comprising approximately 9,000 square yards of paving; 1,700 cubic yards of grading; 2,112 linear feet of curb and gutter and 395 linear feet of concrete waterways.

All such work and materials to be according to the plans and specifications prepared by H. C. Abbott, city engineer, and now on file in the office of Rueben Sutton, city clerk of said city. Forms of bid, contract and bond to be executed by the contractor will be furnished on application to Rueben Sutton, city clerk, or H. C. Abbott, city engineer, and no BID WILL BE CONSIDERED UNLESS ON FORM FURNISHED, TOGETHER WITH BOND IN ALL RESPECTS FULLY EXECUTED WITH THE EXCEPTION OF THE NECESSARY SIGNATURES ON THE PART OF THE CITY. (See Revised Statutes 925-186.)

Plans and specifications will be sent to any

address on receipt of \$2.00, said amount to be returned to bidder upon return of such plans and specifications in good condition.

The committee reserves the right to reject any and all bids and also reserves the right to let the work of improving each street or all of said streets to one contractor or different contractors according to the best bids received.

Dated this 1st day of February, 1916.

C. H. STRANG,  
W. H. PIER,  
J. C. POST,

Committee on Public Works.

### STREETS AND ROADS

**Alton, Ill.**—Assistant City Engineer T. M. Long, who has charge of Main St. paving job, stated that work would include a number of side streets in Upper Alton as well as that planned some time ago.

**Elkhart, Ind.**—Hoosier-Dixie Highway Association has filed articles of incorporation with secretary of state to promote Dixie highway between Louisville, Ky., and Goshen, Ind.

**South Bend, Ind.**—Resolution has been adopted for paving of Eddy St. from Jefferson Blvd. to Sample St. bridge and Mishawaka Ave. from Eddy St. to 19th St.

**Elizabethtown, Ky.**—City council will consider proposition of paving public square of the city with rock asphalt to a depth of 4 ins. Estimated cost is in the neighborhood of \$2,300.

**Lexington, Ky.**—Bids will be received Feb. 19 for sale of \$100,000 bond issue for reconstruction of roads.

**Baltimore, Md.**—Headed by James D. Alcock, large delegation of citizens of Second District of Baltimore county appealed to county commissioners Feb. 3 for bettering of condition of the Old Liberty road, which, they say, has become impassable. Commissioners referred matter to County Commissioner Jas. Rittenhouse, in whose district the road is situated, for investigation and report.

**Kalamazoo, Mich.**—Several large manufacturing institutions whose plants are located in district around East Patterson and Pitcher Sts. will ask city council to authorize paving of these streets in the spring.

**Kalamazoo, Mich.**—Calhoun county is taking definite steps for construction of mileage within its borders of paved way from Detroit to Chicago through Kalamazoo. County road commission has just asked for bids on two miles of concrete highway from city limits through suburb of Urbantale. Specifications provide for pavement 8 ins. thick and 16 ft. wide. Contract will be awarded before April 1. Estimated cost of this first link in the Calhoun county mileage is \$25,000.

**Minneapolis, Minn.**—Park board Feb. 2 approved report of improvement committee recommending that estimate be made by Supt. Theodore Wirth for paving of "grand rounds." This is the 53-mile boulevard system which encircles city. According to estimate of Commissioner A. A. McRae, cost of this work would be \$1,000,000, and city would have 20 years in which to pay for it. Board also recommended the remodeling of Lake Harriet pavilion. Supt. Wirth said this would cost about \$5,000.

**Chillicothe, Mo.**—City council has passed paving resolution for paving of Edgewood Ave. for one block, connecting Bryan and Polk St. paving. This paving is to be of 6-inch concrete and is to be 20 ft. wide.

**Joplin, Mo.**—Commissioners are contemplating repairs on city streets to be started as soon as weather permits.

**Moorestown, N. J.**—Another step toward improvement of Moorestown pike between that town and Camden was taken Feb. 7, when road committee of board of freeholders opened bids for laying durable material. From 36th St. Camden, to Merchantville, road will be of granite. Lowest bidder for this section was W. Penn Corson, whose figures were \$58,748.12 and \$57,801.94, depending upon quality of granite. For improving Blackwood and Grenloch road John Bates was lowest with a bid of \$26,277.26. The bids were laid over.

**Paterson, N. J.**—See "Sewerage." **Plainfield, N. J.**—Plans have been approved for improvement of Westfield or Mountain Aves. to Plainfield, at a cost of \$85,000, and county roads committee was authorized to execute contract for the work after advertising for bids.